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THE MARINE CORPS GAZETTE

MARCH 1941

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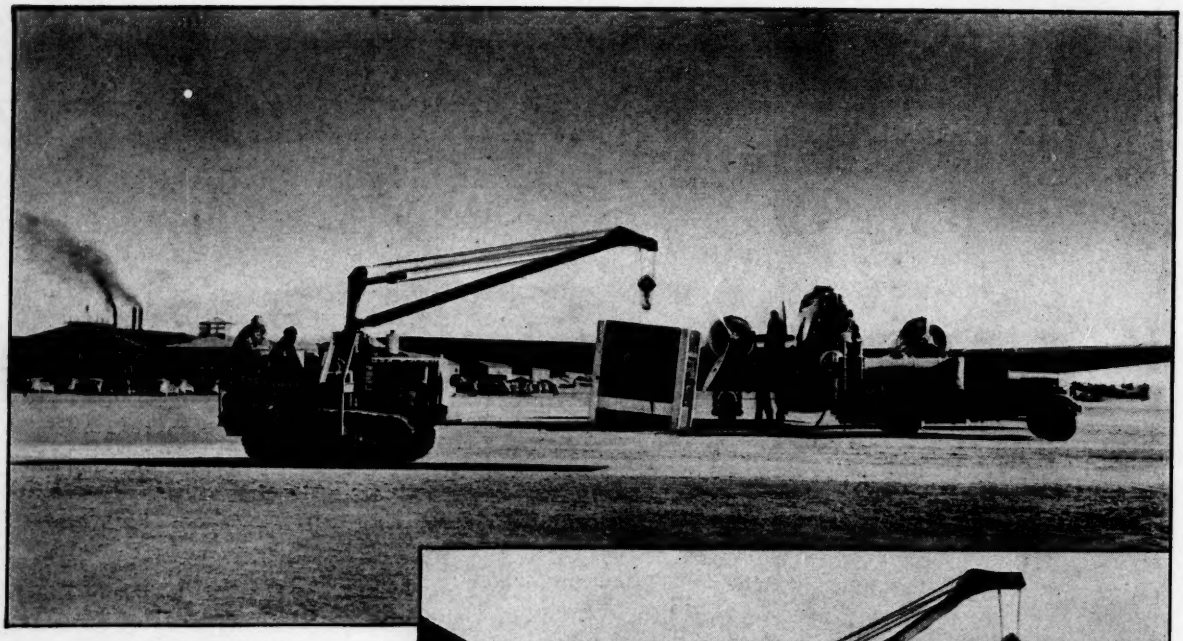
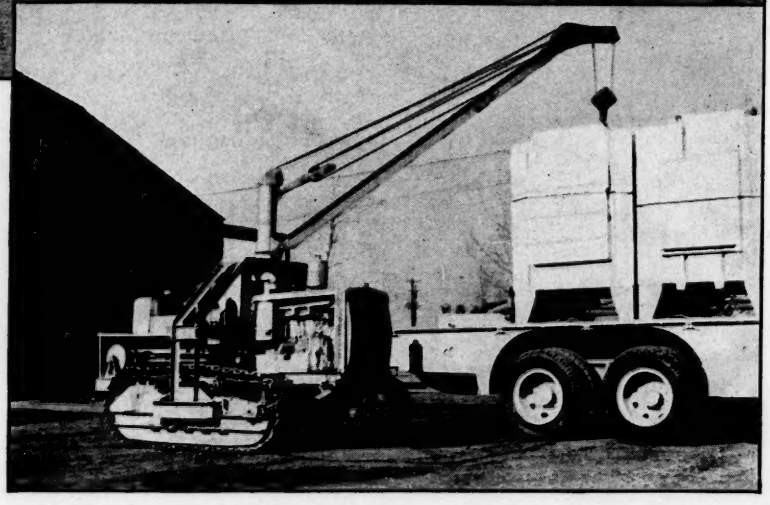
A TRAVELING CRANE THAT ACTUALLY TRAVELS!





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THE AMERICAN'S CREED

A Summary of American Civic Faith

by William Tyler Page

I believe in the United States of America as a government of the people, by the people, for the people; whose just powers are derived from the consent of the governed; a democracy in a Republic; a sovereign Nation of many sovereign States; a perfect Union, one and inseparable; established upon those principles of freedom, equality, justice, and humanity for which American patriots sacrificed their lives and fortunes.

I therefore believe it is my duty to my Country to love it; to support its Constitution; to obey its laws; to respect its flag; and to defend it against all enemies.

THE B. G. CORPORATION . . . . . 136 WEST 52nd STREET . . . . . NEW YORK, N. Y.

A copy of The American's Creed and The Story of The American's Creed, (see overleaf) suitable for framing, will be sent upon request.

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The STORY of THE AMERICAN'S CREED

THE idea of laying special emphasis upon the duties and obligations of citizenship in the form of a national creed originated with Henry S. Chapin. In 1916-17 a contest, open to all Americans, was inaugurated in the press throughout the country to secure "the best summary of the political faith of America." The contest was informally approved by the President of the United States. Through Mayor James H. Preston, the city of Baltimore, as the birthplace of the Star-Spangled Banner, offered a prize of $1,000, which was accepted, and the following committees were appointed: A committee on manuscripts, consisting of Porter Emerson Browne and representatives from leading American magazines, with headquarters in New York City; a committee on award, consisting of Matthew P. Andrews, Irvin S. Cobb, Hamlin Garland, Ellen Glasgow, Julian Street, Booth Tarkington, and Charles Hanson Towne; and an advisory committee, consisting of Dr. P. P. Claxton, United States Commissioner of Education, governors of States, United States Senators, and other National and State officials.

The winner of the contest and the author of the creed selected proved to be William Tyler Page, of Friendship Heights, Md., a descendant of President Tyler and also of Carter Braxton, one of the signers of the Declaration of Independence.

[From the CONGRESSIONAL RECORD]

The complete proceedings in regard to the official acceptance of The American's Creed may be found in the Congressional Record, No. 102, April 13, 1918, from which is taken the following explanation of the doctrinal origin of the creed:

"The United States of America."—*Preamble, Constitution of the United States.*

"A government of the people, by the people, for the people."—*Preamble, Constitution of the United States; Daniel Webster's speech in the Senate, January 26, 1830; Abraham Lincoln's Gettysburg speech.*

"Whose just powers are derived from the consent of the governed."—*Thomas Jefferson, in Declaration of Independence.*

"A democracy in a republic."—*James Madison, in The Federalist, No. 10; Article X of the amendments to Constitution.*

"A sovereign Nation of many sovereign States."—"*E pluribus unum,*" *great seal of the United States; Article IV of the Constitution.*

"A perfect Union."—*Preamble to the Constitution.*

"One and inseparable."—*Webster's speech in the Senate, January 26, 1830.*

"Established upon those principles of freedom, equality, justice, and humanity for which American patriots sacrificed their lives and fortunes."—*Declaration of Independence.*

"I therefore believe it is my duty to my country to love it."—*In substance from Edward Everett Hale's The Man Without a Country.*

"To support its Constitution."—*Oath of allegiance, section 1757, Revised Statutes of the United States.*

"To obey its laws."—*Washington's Farewell Address; Article VI, Constitution of the United States.*

"To respect its flag."—*National anthem, The Star-Spangled Banner; Army and Navy Regulations; War Department circular on flag etiquette, April 14, 1917.*

"And to defend it against all enemies."—*Oath of allegiance, section 1757, Revised Statutes of the United States.*

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THE MARINE CORPS GAZETTE

WASHINGTON, D. C.

Vol. 25 MARCH, 1941 No. 1

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Across the Lake to the Burma Road.

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THE MARINE CORPS GAZETTE

Vol. 25 MARCH, 1941 No. 1

Modern Camouflage

CARDED

BY CAPTAIN PETER RODYENKO, CORPS OF ENGINEERS RESERVE

All Illustrations Courtesy of **LIFE** *Magazine*

CAMOUFLAGE means work done for the protection of materiel, troops and military works against enemy observation, direct and indirect, mainly from the air. Any means may be used if they are effective and practical. Strategic camouflage means efforts to deceive an enemy regarding location and movement of troops.

The individual soldier, in the field, soon learns how to take advantage of cover, or he won't live long. Materiel, however, and military works, not only cannot think for themselves, but, if not well concealed, also betray the presence of the personnel serving them. Hence the need for trained camoufleurs, able to take care of larger problems and installations than the protection of the individual.

Camouflage is an art, but not a "free art." It is limited by definite, scientific and tactical facts. The primary mission of a battery, for instance, is to use its fire power effectively, not to protect itself against detection. Yet, without proper camouflage, this battery will be spotted and soon destroyed.

Camouflage, under various names, has been practiced for thousands of years. Some animals protect themselves instinctively against enemies by either taking cover, or by using their protective coloring, like the carefully stalking cat, the moth, whose wings resemble dry bark, and wild fowl, that lies still, its protective coloring blending in with the vegetation on the ground.

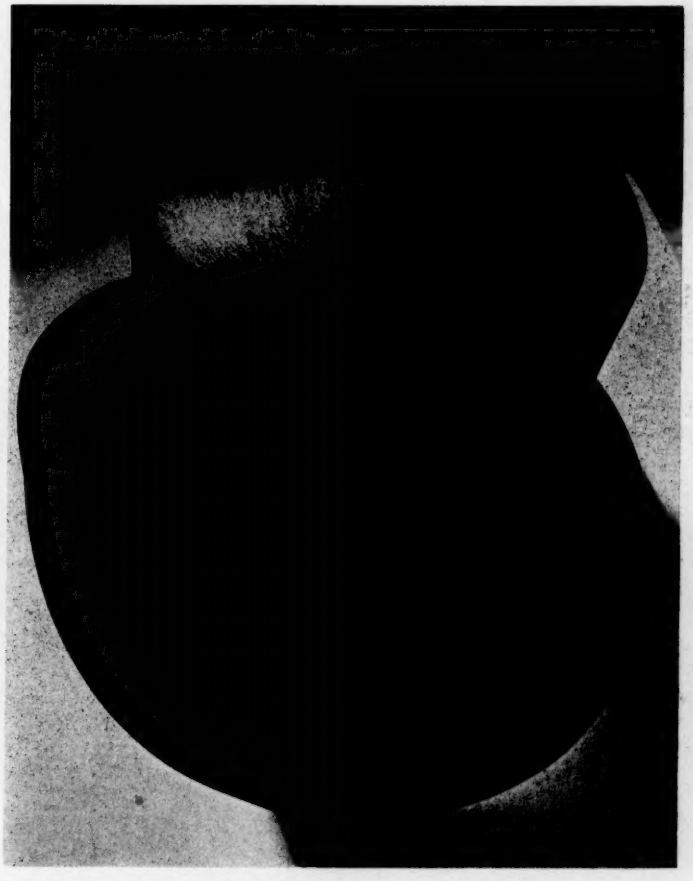
In the course of many years the techniques have improved. But, the basic principles—concealment, confusion and the use of dummies or decoys—have remained the same.

Something that has been concealed, can't be seen and is safe from observation.

If something that's important and dangerous, is made to look unimportant and harmless, then it might be ignored or neglected by an observer, for instance: If a platoon of tanks is made to look like a few cargo trucks, their chances to escape a shelling or bombing are better than if they were not camouflaged.

Dummies are "things that look what they aren't." If, beside an actual artillery battery, another, dummy battery is set up at a proper distance and does not obviously appear to be a dummy, then the chances of being fired upon are reduced in half, for the actual battery.

Many people, civilian as well as military, still think that camouflage means "painting things up" by artists: weird and complicated structures of the Rube Goldberg



While the silk-hat is black, it will reflect the light, when smoothly brushed, and photograph almost white, while spots on which the nap has been ruffled, will absorb light and photograph much darker.

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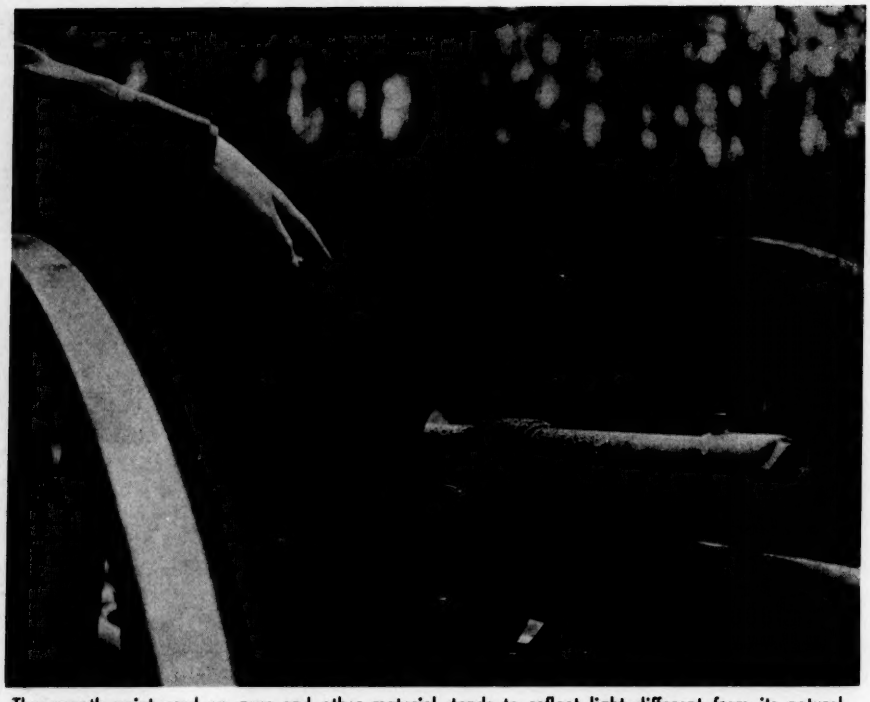


The smooth paint used on guns and other materiel, tends to reflect light different from its natural surroundings. This can be overcome by mixing sand, dirt, etc., into the paint, or, by throwing it on the surface while the paint is still wet.

style and the like, as was done, in many instances, during World War I.

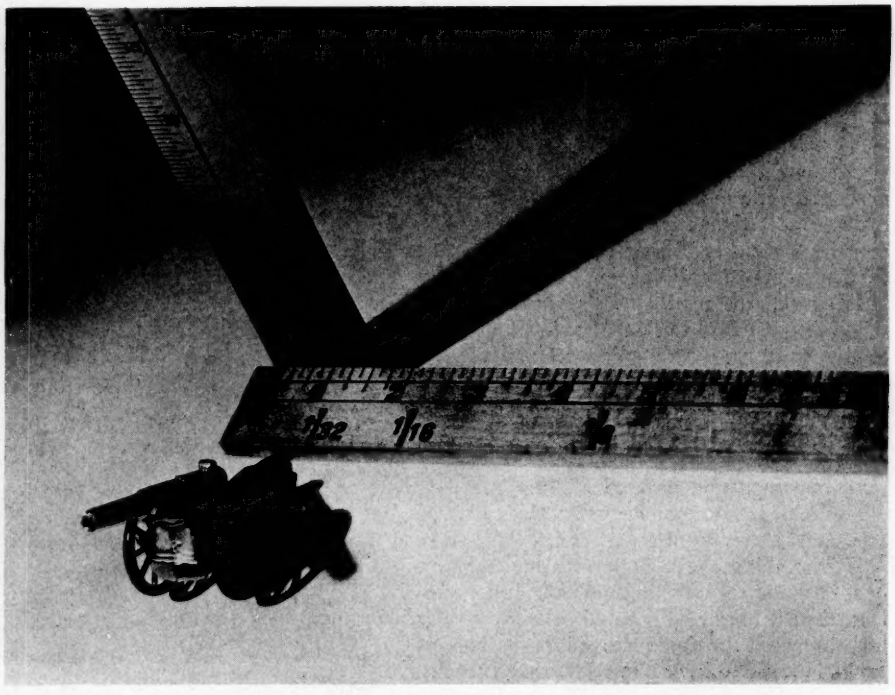
In those days, hardly anything was known about the scientific principles of camouflage. It was strictly experimental, started from the wrong angle—and anything was tried out, in the hope that it might lead to some important discovery. The professional military men turned the job over to artists and architects, who frequently produced some weird and queer designs and structures, that made fine newspaper pictures but weren't worth the proverbial damn in the field.

Regrettably to state, most newspapers and magazines still show such stuff and call it camouflage. It looks well in print, contrary to good camouflage which makes a very uninteresting picture.

Hence, even to-day, many military men have a poor opinion of camouflage technique, mainly based on ignorance of what camouflage actually is, in these modern days. They dismissed the matter as something intangible, mysterious and queer and have given it virtually no thought for the last twenty years. Students of camouflage technique were given the "cold shoulder," received no encouragement and were also regarded as strange characters, chasing the will o' the wisp.

Camouflage technique is no mystery but based on plain facts. It requires common sense. The basic principles, as mentioned above, may be learned from a book, like surgery or medicine, but it takes much practice and experience to do a good job.

The skilled camoufleur will take full advantage of what natural cover there is on the ground, and, if necessary, augment it by using artificial materials, skillfully blended in. If there is a total absence of natural cover, then he might be able, under certain conditions and circumstances, to deceive an observer as regards the nature of the object or objects he does not want him to see.



Geometrical objects throw shadows which will betray their presence in natural terrain. Early in the morning and late in the afternoon, shadows become very long.

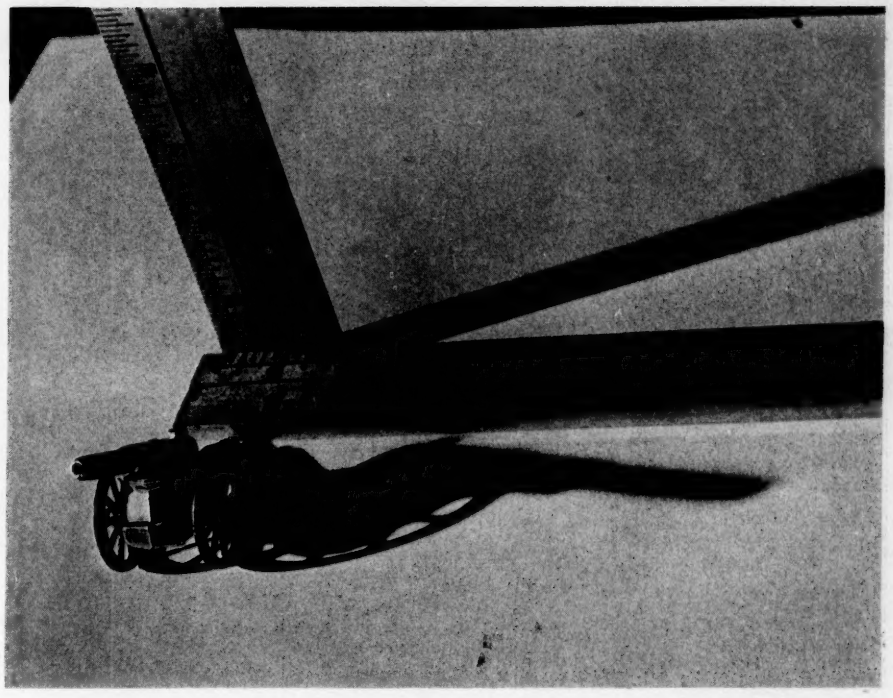
But, the camoufleur is no wizard. He cannot accomplish the impossible and, practically speaking, cannot conceal a 155mm gun in the center of a parade-ground.

Now, what can an observer see from the air?

Very little.

If his ship flies high, at 10,000 or above, safe from AA guns, he will have to use binoculars with a small field of vision that cause an eye strain after a few minutes' use. If he flies low, at 3,500 feet he won't have to use glasses, but, considering the speed of the ship, the objects on the ground will be in view too short a time to do much detecting, and he will be a target for light AA guns and machine guns.

Direct, visual observation from the air is about the least worry of the camoufleur.



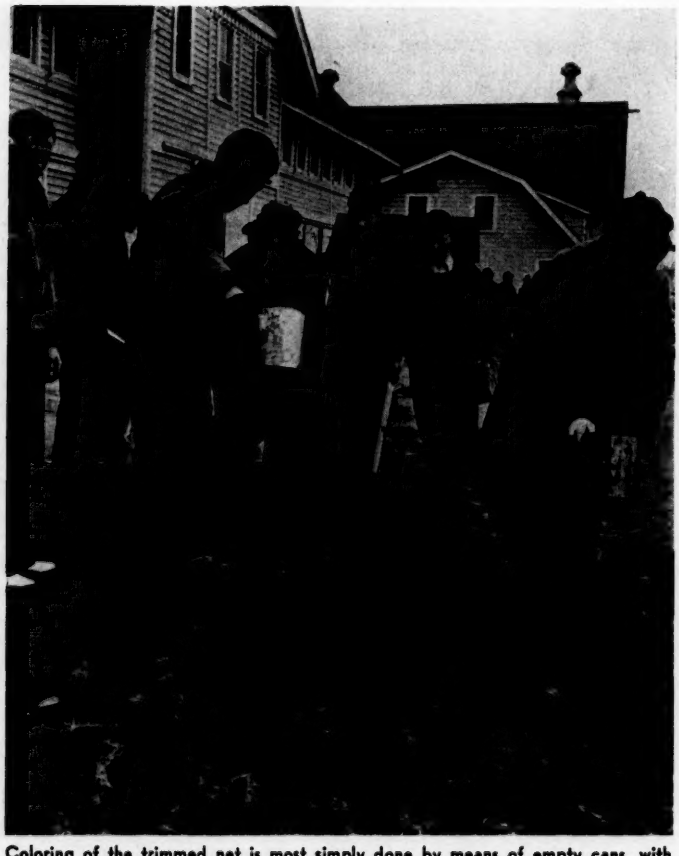
At "sunset and sunrise, shadows may grow as long as several times the actual height of the object that throws them.

It's different in aerial photography, where the human element factor is reduced to a minimum. The motor-driven camera takes strips of overlapping pictures at regular intervals. Television lenses compensate for high altitudes and all the details of the ground will be registered. The prints are studied, at leisure, with a reading glass and if identification of an object is difficult, two overlapping prints when placed under the stereoscope, will produce a three-dimensional effect which facilitates identification.

By placing natural objects between the sun and artificial object, the geometrical shadow can be "overshadowed" by the shadow of natural material, like trees, bushes, etc.

Haze eliminating filters are used. Pictures are taken by using panchromatic film, which is sensitive to all colors and produces corresponding shades or values in black, white and gray on the print. Special infra-red film is advantageous at high altitudes as it registers the infra-red light, objects reflect in various degrees, and which reveals them in such cases where ordinary panchromatic film would fail to do so. Color photography is still complicated and hence not much used in the field, except for experimental purposes.

Narrow strips of opaque fabrics, called "garlands" are woven into fishnet or chicken wire and give it texture.



Coloring of the trimmed net is most simply done by means of empty cans, with holes punched into the bottom, which serve as sprinkling cans.

Color filters will "pick up" certain colors, but require several photos, with and without filters for comparison, which is not always advisable.

There have appeared newspaper articles, claiming that color-blind observers can "see through camouflage." This makes an amusing newspaper story but is to be most heavily discounted.

Modern photographic ships are equipped to take pictures, to develop, print them and to drop them in a container within less than an hour from the time the exposure has been made.

The modern camoufleur is essentially interested in providing means for protection against this, indirect, aerial observation.

Ground observation has become negligible because of the distances involved and the curved trajectory of modern artillery. The Marine, however, will have occasions to guard against observers on the ground, especially in more or less primitive countries and will have to resort to what is called "Indian fighting."

To provide effective concealment by natural or artificial means, the pattern of the terrain must not be disturbed, or, if such is possible, it must be restored to its original appearance, after the objects to be concealed have been located in the terrain.

The pattern of the terrain is made by form, texture, shadow and colors. The pattern of the terrain may be large, small, simple, intricate or confused. A norchard, with its trees planted in regular rows, gives a simple pattern. Terrain containing plain stretches of flat land, hills, ravines, partly covered with woods, gravel pits, meadows dotted with bushes and occasional trees is intricate, as is tropical jungle.

The more confused the pattern, the more difficut is the detection of objects and the easier is the job of the camoufleur.

It must always be taken for granted that the enemy is in posesssion of aerial photographs of the terrain in which the camoufleur has to do his work; that the enemy has skilled readers of aerial photographs that will spot changes.

The camoufleur cannot afford to take anything for granted except that the "other fellow" is as smart as he is, and maybe more. . . .

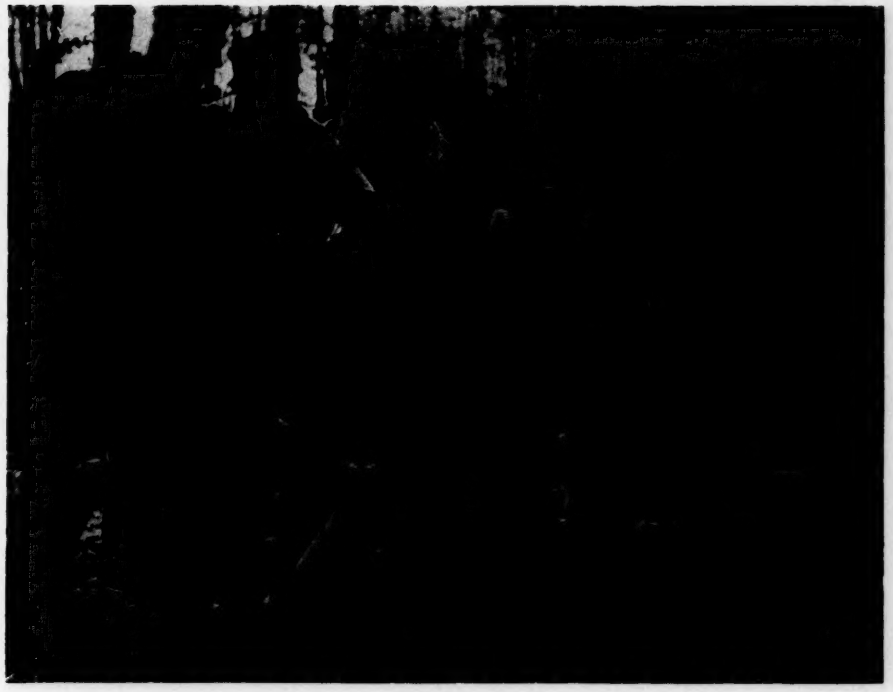
Camouflage must blend in with the terrain.

Nature is irregular in its forms except in minute details that are hardy visible at a few feet distance. Human handiwork is characterized by regularity of form. Regular forms are easily spotted amongst irregular forms, while deliberately created irregular human handwork will blend in with natural forms.

Shadows disclose forms and from the size and the shape of the shadow cast, an experienced reader will not only be able to visualize the shape of the object which cast the shadow but also its height. By either eliminating the shadow or, by throwing a heavy shadow with irregular and natural outlines over the geometric shadow of a geometric object, the camoufleur can overcome this obstacle.

Shadows vary in the terrain. Every tiny stalk of grass will throw an individual shadow that cannot be seen individually, but will contribute a certain shade on the aerial photograph. A grassy plot, with its millions of tiny shadows, will register light gray, tall and strong weeds in a darker gray, while bushes and trees, according to the density of their foliage will photograph dark gray or almost black. Gravel or sandy spots, being almost smooth and throwing no shadows, will photograph very light, almost white.

Texture is a quality opposite to smoothness and may be illustrated by a rug with a long nap, composed of myriads of fine hairs; each one, when erect, will cast a shadow. When the rug is trod upon, the hairs are pressed down and texture is lost. By brushing the hair up again, texture may



Camouflaging a trench mortar (dummy) with natural materials.

Natural material must be placed not only around the mortar but also atop, but must be easily removable.

The completed camouflage installation blends in with the natural terrain and could not be spotted on the aerial photograph.

be restored. In nature, the place of the nap is taken by vegetation. Terrain with much and variegated vegetation will absorb light, hence photograph darker. If there is a preponderance of light vegetation, like grass and low weeds, the terrain will photograph in a lighter gray and the sand and gravel spots with smooth surface that reflect light will photograph white, so will sand dunes, etc.

It may sound unbelievable to a layman, but tracks, made by a light passenger car on a dry stubble field may be inconspicuous to an observer nearby on the ground, yet they will register very clearly against their surroundings, when photographed from an altitude of several thousand feet in the air.

The camoufleur, therefore, will bend his efforts toward producing a textural effect which will be identical with the texture of the terrain. He may obtain this result either by using natural camouflage materials, like branches from trees, bushes and clumps of weeds taken from a site fact from the place of the installation, to avoid detection, or by producing a suitable texture with artificial means like fabrics, etc.

It would, of course, be obvious, if, for instance, oak branches were to be used for camouflage in a woods composed of evergreens. If natural materials are cut, the white stumps must be blackened with dirt, etc., to prevent detection from the air, and such supplies should be obtained several hundred feet from the place they will be used.

Color, contrary to public opinion, is the least of the four elements in camouflage. On the photographic print, it is translated into shades of black and white only. Color that may appear to the eye as matching the surroundings will not match on the photograph unless the texture is about the same as the surroundings. To obtain a photographic match the corresponding photographic shade has to be produced. As a whole, the photographic match of colors is several shades darker than the eye match of the same color. It has been found that slate gray is a photographic match for medium green as found in grass. Greens, blues and yellows will photograph light in shade, while reds, browns, etc., will register much darker. White will photograph a light gray. In snow camouflage, plain white paint, whitewash or white fabric is inadequate because of this fact, and, to imitate snow, the crystallinic structure of snow with its light-reflecting facets has to be imitated. This writer has experimented with plastic paints containing a strong admixture of ground mica, ground asbestos and marble dust and found the results to be very satisfactory.

To illustrate the secondary importance of color, when compared with texture, it may be stated that, if an excellent artist, with all the time at his disposal, were to produce a painting of grassy lawn on canvas, the masterpiece, when placed next to real lawn, might deceive an observer nearby because of its realism. Photographed from a mile and a half in the air, the coloring will become of secondary importance and the canvas or board, lacking the texture of the actual grass and being smooth in surface, will reflect the light differently and will photograph much lighter in shade, thus showing up the camouflage.

The familiar naval camouflage of dazzle-painting with its criss-cross designs as used in World War I served an entirely different purpose from concealment. It was not intended to make the vessel thus adorned, invisible, but helped to confuse hostile naval gunners operating at long ranges, as regards the direction of travel of the target, a very important factor, as because of numerous variables entering the computation of firing data of long-range naval guns, a small error made in observation of the target, based on triangulation, would cause a miss.

Modern naval warfare, mainly based on submarine or aerial attacks has made this picturesque technique obsolete. Ships are painted a dull bluish-gray, apt to blend in with the sea that makes detection through the periscope of a submarine difficult. There is, at this time

of writing, no antidote against naval observation planes and bombers.

Actual experience in the field has proved that the relative importance of camouflage requirements is about as follows:

Proper choice of location	40%
Camouflage discipline	25%
Type of construction	20%
Camouflage materials	15%

If natural material is used, it must be cut several hundred feet from the site of the camouflage installation. Stumps, etc., must be blackened as they will register. Slashings and cuttings will show, hence should be made far from the site of camouflage.

The most important of above factors is intelligent reconnaissance not only for the tactical mission but also for protection, which, unfortunately, is generally disregarded in this man's Army as became very obvious during recent maneuvers because of the general lack of knowledge of what camouflage actually is. Much labor can be avoided if brains are active in camouflage that are not one-track minded. If guns are run under trees with a wide and spreading foliage that offers protection against overhead observation, vertical and oblique, the guns will be safe without doing a stroke of extra work and this type of camouflage is preferable to any other. A knowledge of human psychology and quick thinking is also of great help. During a recent maneuver a battery commander placed his AA guns in a railroad yard and was not detected by aerial observers, who, when interrogated later on, stated that "no sensible person would put AA guns into an awkward place like a railroad yard" and hence did neither look out for them nor take any photographs of what they believed to be a most unlikely site for AA artillery.

Camouflage discipline consists in avoiding or obliterating traces of human activity in the terrain, particularly of tracks made by vehicles and paths made by marching or walking troops. Often an otherwise well camouflaged position may be spotted by numerous white spots in the vicinity, either tree stumps that haven't been blackened, or the faces of soldiers looking up to see the airplane flying overhead. Paths caused by men carrying ammunition or supplies, smoke from wood-fires, poorly concealed field-kitchens, latrines, regularly spaced tents, anything connected with "spit and polish" for the benefit of inspectors, are matters that can be avoided if proper camouflage discipline is observed. Even heavy tracks, that cannot be obliterated, may be made to look harmless if they, instead of stopping at a definite place, are continued and made to look as if they'd lead to nowhere, criss-crossing the terrain in a manner confusing the reader of aerial photographs. It also means maintenance of camouflage, artificial as well as natural. The latter has to be kept fresh by changing it or by watering it. Drying foliage will curl and the under side of the leaves, being lighter in color, will register. Artificial camouflage too, has to be frequently checked, especially after rain. "Policing" up is also very important. During the War in Spain, a certain, well concealed artillery position was spotted by the wash, the soldiers had hung on the camouflage to let it dry.

One of the most popular methods of concealment, which originated during World War I is the flat top technique, which is based on the familiar fact that a person, seated on a screened-in porch, can see what's going on in the street, while the people in the street can't see who's sitting on the porch behind the screen, as the light is reflected by the screen back into the eyes of the observer in the street, who, therefore, can only see the screen and not who's sitting behind it. A flat top is about the same as a screen, placed above an object, parallel to the ground while the lens of the aerial camera is taking the place of the human eye.

However, a mere screen or fishnet, as used in camouflage, would not be opaque enough to conceal a large object placed underneath. Hence, the net, or chickenwire which also may be used for a screen, has to be made partially opaque. This fact is apparently not well known, as could be seen during recent maneuvers. This writer frequently saw almost empty nets stretched over guns in a

haphazard manner, with the troops evidently ascribing magic properties to the nets. Upon interrogation the soldiers replied that they didn't know camouflage, as they had never received any instruction, except for occasional talks out of "some book." They had erected the nets over the guns as they had received orders to do some camouflaging and merely executed the orders without knowing why. They were more interested in keeping the guns well painted and the metal-work shiny, than in concealing themselves.

To make an effective flat-top out of a net or strips of chickenwire, narrow strips of some fabric must be woven into the net, so that both ends of the strip called "garland" dangle freely underneath the net. These free ends, dangling in the breeze, help to obliterate shadows when the installation is photographed. The strips are about as wide as the length of a man's thumb and as long as a man's fore-arm. They are woven irregularly, densely in some places, especially in the center, and "feathering out" toward the edges of the net, or chickenwire. This is called "trimming" the net. The garlands must also be suitably colored.

This can be done either by using previously colored material, or by cutting the garlands and dipping them into a container with paint. Other methods are to weave the material into the net and coloring it afterwards by using either a spray-gun or with hand-brushes.

It is the experience of this writer that one of the most economic methods that can also be used in the field, is, to take a few empty tomato cans, punch a few holes into the bottom, preferably, so that only one half of the bottom is punctured, and use them as sprinkling cans. Spray guns are generally out of order because some gadget has been lost, and also requiring straining of the paint through cheesecloth which is not always available, while brushing paint on by hand takes very much time. Both these methods also tend to cause a uniform coloring of the net which must be avoided.

The net is then stretched over the obpject to be concealed, and, if necessary, several nets will be combined in suitable, irregular shape or design. Nets should be fastened to existing trees and bushes. If such are lacking, freshly cut poles, with the bark left on, should be obtained. Guy wires and supporting wires may be used to hold the net and the poles in place. No. 16 wire being thin and easily handled, is preferable to the No. 10 wire generally recommended in official publications, as the latter is hard to handle and hard to cut.

A certain official publication states that at this time nets of various sizes are articles of issue. This writer, however, believes that this is poor practice. Camouflage material should be standardized and it would be rather difficult in times of war to find the right size of net for the type of installation. Hence, a unit net, serving all purposes, that can be combined for large installations, is preferable.*

The same publication also advocates a complicated and time-taking wire understructure for a flat top. This is not necessary in most cases and advisable only if there is no natural props available to which the nets can be fastened. It also states that the net must be always stretched parallel to the ground. This holds good only for terrain which offers little or no natural props, but may be safely ignored in most cases.

Now that the flat top has been completed, it will hide what is placed underneath. But, unless the net has been well trimmed, with garlands and, if possible, also with some natural material, like branches or small trees, or clumps of weeds that have been placed on top of the flat-top, the camouflage installation will show up, which, of course, must be avoided. The best advice is to attempt to reproduce, on top of the flat-top, the terrain as it is on the ground which may sound difficult but is not hard to accomplish.

Such a flat-top should be as close to the ground as possible because of the fact that, as proved by experiments, an object will cast shadows from three to six feet in length for every foot in height above the ground, at various times of the day and year, the sun shining, of course. Hence, an ordinary supply truck, standing about nine feet high, will cast shadows from twenty-seven to fifty-four feet in length on a sector on the ground. This sector varies with the latitude of the site. The camoufleur has means of eliminating shadows, by letting a camouflage structure rise from the ground at an angle of 10 degrees, leading it over the object to be concealed and then bringing it back again so that it "dies" into the ground again at the same angle. This method, however, is practical only in case of very low objects and those of considerable importance, because of the labor, time and material involved, but has been used, with great success, by Bedouins in desert warfare for the concealment of vital water-holes, as well as by the British.

The net or chickenwire should be stretched at an "optimum" height above the object, to prevent it from being silhouetted through the irregularly trimmed net. This optimum height is just about three feet in most cases.

In addition to the flat-top, the object itself should be checked against shiny spots that may reflect light, which must be obliterated by using dirt, strips of fabric, grease or oil into which some dust, etc., has been mixed. It is very advisable to paint military objects with flat paint, into which dirt, sand, small twigs and broken leaves have been mixed, which will not improve their appearance but will help to conceal them. If possible, field guns, etc., should be dug into the ground as deeply as practical so as to reduce their height above the ground. After the overhead cover has been taken care of, the sides of the object should be hidden by either letting part of the net hang down draped irregularly and loosely or by "planting" bushes or small trees around the object or by the use of both these methods, so as to protect it against oblique-lateral-panoramic aerial photographs.

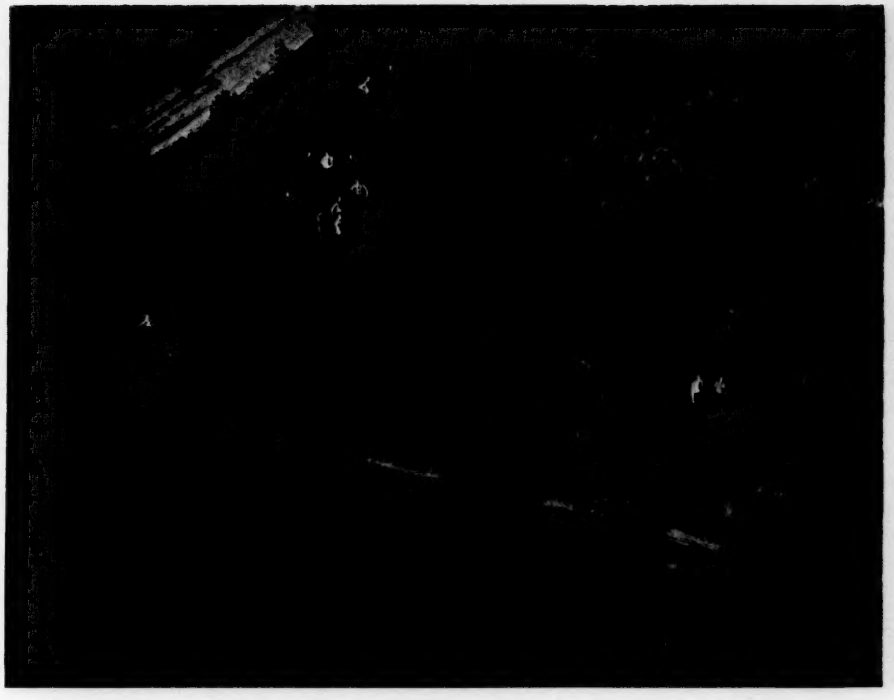
This latter part seems to appeal to the average soldier. This writer, during recent maneuvers, was frequently informed, that "some excellent camouflage" could be inspected at certain places. It was found, that in most of these cases, shrubs, etc., had been placed all around the object, but that overhead protection had been neglected.

*See article "An All-Purpose Net" by the same author in February-March issue, *The Military Engineer*, 1941.

In field artillery, the barrels, contrary to public opinion, are easily concealed. Generally, the tops of the caissons, which, being flat, reflect the light, were the "give-away." In AA artillery the cross formed by the outriggers and the platform require most of the work to be done. Trees, carefully tied to the barrel, are generally good camouflage.

In cases of artillery, care must be taken to see that camouflage material may be removed at a moment's notice, hence, wiring should be avoided as much as possible.

At this time of writing, oil-colors or paints are still used for whatever color-work has to be done in camouflage. This is not the best medium. It is waterproof, of course, but oil-paint takes considerable time to dry. If it must be used, the thinning out with gasoline is recommended at a rate of about five gallons of gas for every gallon of paint. When storing fabric treated with oil-paint, much ventilation must be provided to prevent spontaneous combustion, especially in summer.



On this aerial photo are two field guns, one AA gun and one trench mortar in the process of being camouflaged.

To the mind of this writer, commercial casein paints, soluble in water and being flat and not as glossy as oil paint, should be adopted for use in camouflage. It is believed that experiments with water-soluble paints are now under way in the Army.

The use of dummies has proved to be of very great value. When hostilities started in China, the Japanese fleet kept at a respectful distance from the Woosung Forts on the lower Yangtse and Whangpoo as they apparently bristled with heavy artillery, not knowing that most of these formidable guns had been made of wire and papier-mache, painted black to look more impressive. At Chapei, in 1934, the Chinese had one actual armored train and several dummy trains. The Japanese high command grew desperate when, as soon as one "armored train" had been successfully bombed, another one appeared without delay, not knowing that the "trains" made of bamboo and painted paper had been prepared in advance and were kept in "knocked down" form in various places, to be erected when needed. At Hungjao, the Nipponese Luftwaffers gleefully expended their bombs on dummies made of the same materials as the "armored trains" while the real ships were safely grounded under cover and could not be spotted.

During the Spanish War, General Franco's artilleristas concealed an AA battery in a dense wood several miles long. A mile or so away from the actual battery they simulated another one by slashings and cuttings in the woods and then attempting to camouflage the damage to the woods. The Reds promptly bombed the dummy battery and were "liquidated" by the real one which had plenty of time to get into action.

Any kind of material may be used in camouflage if it is practical and available. This point cannot be over-emphasized. The present issue nets have to be used with great care. They should not be left in their present square or oblong shape, but should be cut down to irregular shapes or forms. The nets are of dark color, but, for reasons incomprehensible to this writer, they are edged, for support, with a hempen rope that has been left in its clean and pristine color, hence will photograph white. This rope should be blackened with old crank-case oil or similar material, before the net is put to use.

The more brains is used, the less labor will be needed.

Realizing that a mere academic discussion of camouflage technique is insufficient, this writer attempts, in the following lines, to show "How" things are done.

BIVOUACS. Instead of precise tent streets, scatter the tents and put them under trees, near rocks and boulders. Cover tents with foliage, if possible, spot tents with oil or otherwise darken their color. The present khaki colored tents photograph nearly white. Deceive observer as regards number of troops.

INFANTRY. If a hostile ship approaches, scatter and lie down still, face downwards. Don't let up as the

A flat top net is stretched over the field gun. The net with the garlands blends in with the terrain.

face will show white and even a visual observer will see you.

MACHINE GUNS. Take advantage of existing bushes, trees, hollows, etc. Machine guns work in pairs. This fact is well known to the enemy. Therefore, try to conceal one, at least, or make it look like something else; especially if there are fallen logs about, etc., the task will be simple.

TRENCH and CHEMICAL MORTARS are easily concealed by either placing them inside a group of bushes or a large bush. If the terrain is dotted with irregularly spaced bushes, if necessary you may "create" another bush by planting it around AND above the mortar.

HOWITZERS. The same technique as for trench and chemical mortars except on a larger scale. Care must be taken to also camouflage the caissons, whose flat cases will reflect the light, unless covered with foliage.

ARTILLERY and OTHER INSTRUMENTS. Place them, if they are to be used in open terrain, on a spot that is mottled, like a sandy patch with some weeds, drape some fabric over them and natural material. Find cover for the crew.

AA ARTILLERY. About the same technique as for Field Artillery, except that the conspicuous cross formed by the platform and the outriggers must be concealed. The four outriggers should be covered, each in a different manner, so as to avoid uniformity. It also should be remembered that an AA battery is often spotted by the diamond-shaped group of the four guns. Hence, if possible, use different methods for each gun, like concealment for two or more, and confusion of identity for the other. An AA gun can be easily made to look like an abandoned dump of some sort.

FIELD ARTILLERY GUNS. Avoid equidistant emplacements. Take advantage of natural cover. Watch caissons as stated above. Keep motor vehicles out of sight. Better to have difficulty in maintaining control over the guns than to be shelled or bombed out of position.

TANKS and COMBAT CARS. Make them look like harmless trucks, by cutting poles, saplings, bending them in the shape of a horse-shoe and fastening them to the tanks. Then to be covered with tarpaulins to make the vehicles resemble cargo trucks. If tanks, etc., are to be parked under cover, see to it that the conspicuous tracks do not stop at the parking place. Keep one vehicle running, making tracks that lead all over the place and back to the road, etc., whence they came.

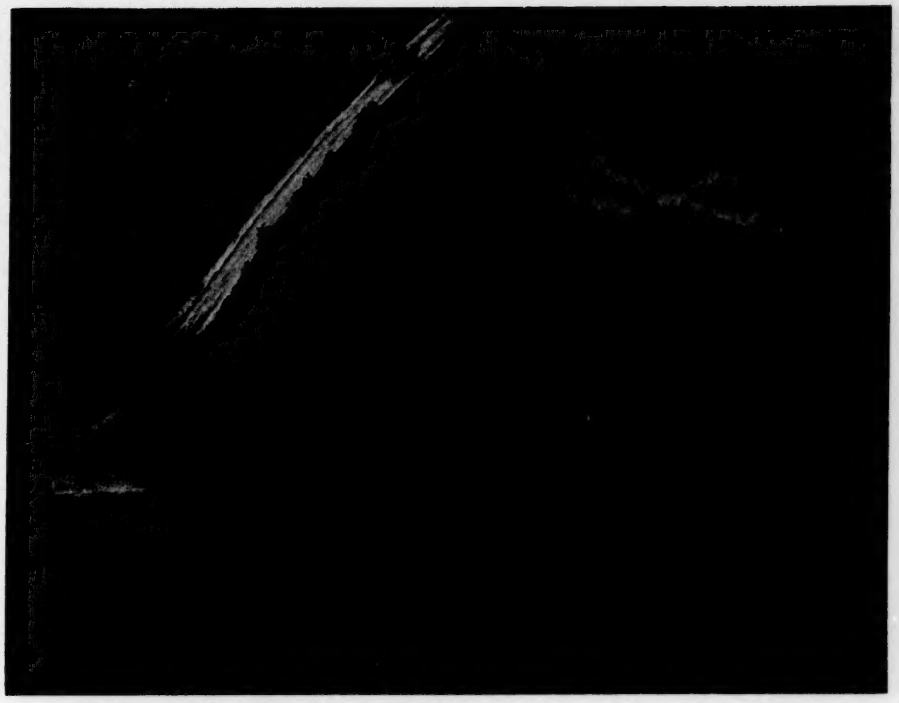
ANIMALS. Avoid regular picket lines. Have animals tethered in small groups under cover.

DUMPS and DEPOTS. Do not centralize them in a large establishment but break them up into small dumps under cover, preferably near roads so that there will be a minimum of paths.

ADVANCED AIR-FIELDS. Simulate additional advanced air-fields by selecting a plausible looking site and place dummy airplanes, made of fabric and a few sticks (bamboo), close to the edge of the field. Have some motor-vehicles make plenty of tracks, to make the field look as if it were used, but remember to make the main number of tracks in the direction of prevailing winds, and at the usual angles. Dummies should be at least 3 feet high, so as to throw some shadows.

AIRPLANES. In addition to dummies, break up the outlines of the ship, especially the wings, by partly covering them with fabrics, natural material, etc. Painting with water-soluble colors is often advisable.

BRIDGES. To conceal a bridge is virtually impossible, because of the very elaborate steps that would have to be taken. But, dummy bridges may be erected and the actual bridge may be camouflaged as to appear damaged, to avoid bombing. This can be done by taking lumber, etc., and debris and placing it on top of the bridge, near the center, and into the water, around a pier. However, this type of camouflage has to be done by an expert, preferably by some one who has seen destroyed bridges.



The AA gun and the trench mortar have been well camouflaged and can't be seen. The two field guns, although much smaller than the AA gun, are poorly camouflaged, neither texture nor coloring blending in with the terrain and are easily spotted.

ROADS. To camouflage a road, has not much sense because of the length. But, it is often advisable to deceive an enemy as regards the condition of a road, especially in case of a withdrawal, when a delaying action is to be fought and a position about to be prepared. To confuse hostile observers in road-reconnaissance for mechanized elements, the impression may be created as if the road had been heavily shelled or bombed, hence is impassable for mechanized elements. This can be done by means of dummy, portable craters, that may be set up at Cross Roads and Road Junctions.

Artificial, portable and folding craters, requiring but little space in transportation, may be made from wooden boards that have been nailed together to form wedges, about six feet long and, at the high end, about three feet high. Four or six of these wedges are needed. Fabric is then nailed over the narrow, upper edges of the wedges and sufficient material is left over so as to hang over the high ends, to extend over the ground. The fabric should be painted or stained in browns, blacks, gray either by using paint, or, the same effect may be obtained by actual natural materials. When to be used, the wedges are set up, so as to point with their sharp ends toward the center, the material is extended over the ground, and rubbish, soil, etc., heaped around in such a manner as to imitate a crater. Care must be taken to make it realistic.

Another effective means to confuse aerial photographers on road reconnaissance is to place dummy obstacles on the road, which, while actually ineffective, will look formidable from the air. A few trees felled so that they fall across the road will be sufficient to create this effect.

On the other hand "negative camouflage" may be carried out by repairing a damaged bridge to such an extent as to make it look passable when it actually is not. Craters may be blown on a road and then concealed by stretching fabric suitably painted over the crater so as to conceal it.

It shall also be remembered that camouflage has to be executed by the troops that need them. In the U. S. Army there are, at least on paper, certain camouflage units, which, however, are not expected to do the actual camouflage work, but who will, if and when organized, act as advisors and inspectors only. This fact is not known to many, who expect camoufleurs to do the work and this lack of knowledge may, perhaps, be accountable for the fact that camouflage training of troops has been as neglected as it has been and still is.

To the knowledge of this writer no camouflage troops are provided for the U. S. Marine Corps.

Extensive practice and experience is necessary in camouflage. The camoufleur should have good engineering knowledge, with a flair for the art. He should know something about aerial photographs, should be able to read vertical aerial photos, how to use a stereoscope and have a "feeling for the ground." Able to visualize what things look like when seen from the air, to translate color into photographic values. He must be ingenious and resourceful. He should know human psychology, and, so this writer believes, requires the persistence of a cat and the skin of a pachyderm, with a saving sense of humor. Before all, he must like his job.

CARDED

Island Defense

By 1st Lieut. Robert A. McGill, U.S.M.C.*

THE Marine Corps, and more specifically the defense battalions, are being faced by tactical problems for which there is no cut and dried solution. Protection of small outlying patrol boat and other bases calls for the tactical placement of weapons for the many phases of a hostile attack.

We have learned and must face the facts. An enemy air attack when once launched will in most cases carry out its mission to completion. A defense can not be considered a defense in the exact sense of the word. In other words, some portions of a defended sector will be bombed. We must be prepared to withstand this damage, and to make a bombardment of this sector so costly that the enemy will only make sporadic raids or give up entirely.

Preliminary defense works of the following nature must be constructed:

Bomb proofs for all personnel, and all equipment not actually in use at times of defense against enemy aircraft and surface vessels.

Splinterproof protection for all personnel manning guns, searchlights and soundlocators, etc., even at the expense of perfect camouflage. After all, camouflage is only valuable during the alert phase.

Absolute bombproof shelters for all patrol flying boats. Said boats will be the main objective of an attack and must have protection from sea and air bombardment. It is too much to visualize a defense so strong that it will be impenetrable from the air.

Bombproof protection for all supplies especially gasoline and oil.

At first glance the above appears to be a monumental task. It is. IT MUST BE DONE! If a base is to be kept in operation, no effort or expense must be spared to protect against bombardment.

All attached infantry defense forces must have bombproof shelters at the positions they are defending. They must have protection during the initial portion of the final defense phase when enemy aircraft will be straffing and bombing.

In the following, the tactics of defending field artillery and infantry will be ignored. Their place in the defense has been well covered elsewhere.

Tactics of Defense

Defense tactics are best illustrated by defense types, starting with the ideal and ending with that type calling for the greatest amount of thought, planning, and effort.

Inland Harbors and Bases

Bases falling into this category present a terrain problem which is easily solved. That is, it is a simple matter to place the AA artillery, searchlights, soundlocators, and seacoast artillery in the most efficacious position. Here we have a channel running from the sea to the harbor and attacking air forces are forced to pass over land no matter from which direction they attack. The above is to the decided advantage of the defender as his defense set up is not affected. With only slight variations imposed by terrain features such as swamps or lack of road net we can take our tactical emplacement "from the book." In the ensuing discussion a point objective will be used. In most cases the amount of material available to us may be limited. We will therefore limit ourselves to three AA gun batteries, three batteries of medium surface artillery, and three searchlight batteries of six searchlight and soundlocators each.

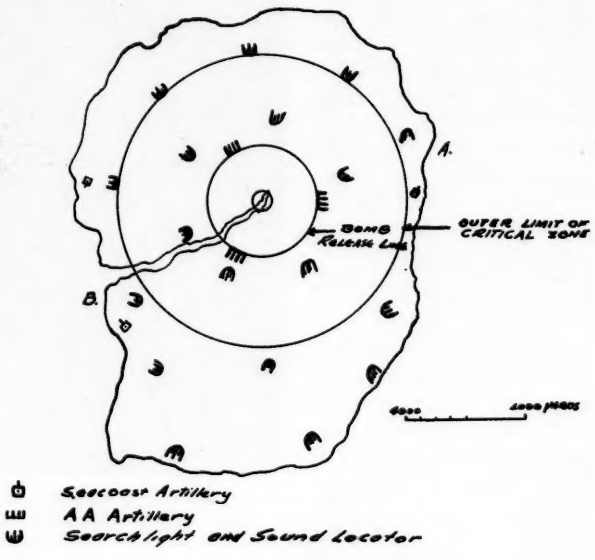


Figure 1

Refer to figure 1. It will be seen at a glance that the bomb release line and the outer limit of the critical zone computed for a 200 mile per hour bomber flying at 15,000 feet fall within the limits of land. We are able, then, to have an all around defense.

Assume good landing beaches at A and B. Our surface batteries can cover these and their respective transport areas. When these guns are emplaced it should be kept in mind that besides a main mission these batteries will have contingent or secondary missions. While they should not be placed on the skyline, they should be placed so that they are masked as little as possible in all directions. Although direct observation may not be used in fire control, case three firing may be used. Surface artillery should not be placed within 1,000 yards of the beach. It is better to lose 1,000 yards of range in a seaward direction and gain one

*Third Prize Essay.

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hundred degrees in field of fire. Also, should the beach be taken the battery is not lost. Batteries should be emplaced so that their minimum ranges do not exceed the range to the beach. Hostile troops may be fired upon.

AA gun batteries can be placed within mutually supporting distance. Searchlights can be used for dual purpose. Not only will they be used as an outer and inner ring for the AA defense, but they may also be used for the illumination of surface targets attempting a night attack. Here, then, we have the ideal ground features, but in actual practice we will never find them.

The Large Island Base

The large island base presents an increasingly difficult problem. No island base in its outset has ever been constructed with its shops and warehouses inland. In other words, the heart of all the industry is at the water's edge. This is excellent for purposes of accessibility for ships and patrol planes wishing to utilize the facilities. But the defense of such a base is difficult.

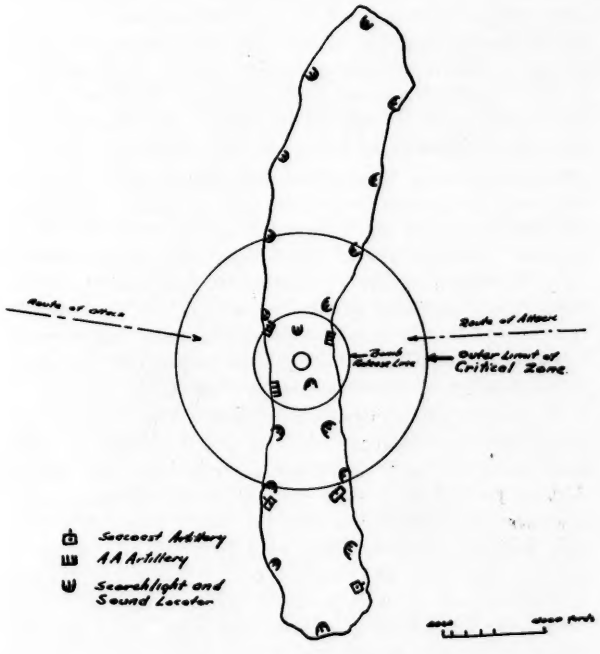


Figure 2

Refer to figure 2. Assume an island some thirty miles long and from four to five miles wide with suitable landing beaches at points indicated. The following plan or modification thereof should be used.

The medium artillery is placed so that the beaches and respective transport areas are covered. As much field of fire as is practicable without sacrificing too much seaward range is strived for. This portion of our defense is easily accomplished.

However, on attacking the problem of placing the AA artillery, we hit a snag. It will be seen from the figure that almost half the perimeter of the bomb release line and fully two-thirds of the critical zone are in the water, and we are unable to place the batteries as we desire. This means that the hostile planes may come in, drop their bomb loads, and leave without at any time being over land. The effective range of the guns is decreased the amount that the defense must be drawn in to coincide with the terrain. The most probable lanes of attack of the enemy will be in the two directions shown for the reasons given above.

The searchlight and soundlocators are even at a more decided disadvantage as we will be unable to push them out to the limit of the critical zone as we would like to do. But we can ring the perimeter of the island, and so place our lights as to give illumination to the medium surface artillery. Here the advantage is with the attacker, but not so much that we can not give a strong defense to the island defended.

The Small Island Defense

Here is our most difficult defense problem. One in which the air attacker has the decided advantage. The base under discussion is so small that the bomb release line and the outer limit of the critical zone are all to seaward. At no position on the island may the AA batteries or the searchlights and soundlocators be placed to their best advantage.

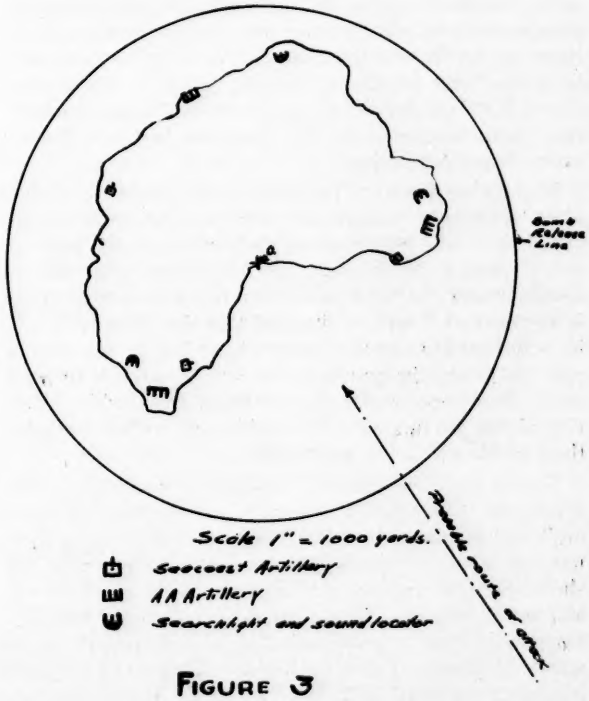


FIGURE 3

Refer to figure 3. Assuming the 200 mile per hour bomber at 15,000 feet, the bomb release line is 3,000 yards forward of the objective.

As it is impossible to comply with the tactical doctrine illustrated in figure one, the only alternative is to push the guns and searchlights as far as possible to seaward. How-

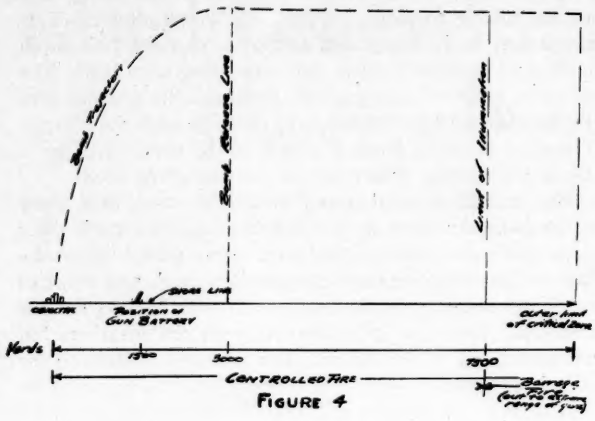


FIGURE 4

ever, the gun batteries should not be placed on or near the beach as this operation would make them too vulnerable to surface attack.

In figure four we have placed the gun batteries 1,500 yards from the objective as we are limited by the size of the island. If the horizontal range of the guns is 10,000 yards, we have lost 1,500 yards effective range and the guns can not be placed on or near the bomb release line. Bombing formations flying at 100 yards per second may be fired on for 85 seconds (10,000 yards — 1,500 yards equals 8,500 yards) before planes reach the bomb release line. Fifteen seconds of firing time have been lost, but the aspect is not too serious.

Nightfiring presents the most dismal aspect. Unless illumination is to be furnished from a water borne system searchlights will lose much of their effectiveness, and can best be used for surface targets. Should the lights pick up hostile formations 6,000 yards from the respective positions in figure three it will be observed that the planes will only be 4,500 yards from the bomb release line at the time of pick up, giving the gun batteries only 45 seconds to track and fire; not enough for efficient firing and tracking. Letting planes get this close to an objective without bringing them under fire is not practicable.

Tactics must be changed and should encompass these principals. An efficient warning net composed of small craft, radio equipped, used as picket boats or listening posts must be used. These will be placed about ten miles off shore. Ample warning will be given to the gun batteries and soundlocators. Shore based soundlocators can give the guns a close approximation as to the azimuth of the attacking planes. From intelligence agencies or previous bombings the usual altitude at which the enemy bombing planes fly will be known. Because of the smallness of the objective most of the bombing courses will be close to or will be incoming runs. A close estimate of successive horizontal ranges may be made using the angular height from the sound locators and the average estimated altitude of the planes. Immediately when the planes come within range the guns commence firing. In this phase of the firing volume of fire is paramount. Fuze range is decreased when it is estimated that the slant range has decreased to warrant such change. This is a barrage pure and simple, and is used in lieu of illumination. See figure four. It continues until the lights are able to pick up the planes, at which time the gun batteries revert to their normal procedure. AA batteries most effective fire then will be from that point at which the lights pick up the plane, during the time the planes are dropping their bombs, and while they are either turning away from the objective or passing over it. Hence, the necessity for an adequate protection for personnel operating defense weapons can be visualized. Bluntly, we will be bombed, we must strike back, and our protection must be of the best.

General Discussion

Small outlying island bases may be likened to an outpost line of resistance in land warfare. As bases for patroling aircraft, and as refueling and minor repair depots for surface craft they extend the recnnoitering distance for the main body of the fleet a valuable distance. Occupation alone denies them to the enemy. However, a screen of island outposts once occupied should be preserved in their entirety. The loss of one seriously jeopardizes the security of the others. Such loss gives the opposing force a base from which to operate in furtherance of his plans, and denies a valuable area of reconnaissance to us.

Maintenance of the tactical integrity of such outposts demands the utmost in defense efforts. Small bases are vulnerable and too much dependence can not be placed on the shore defenses alone. There must be a mobile defense force composed of aircraft carriers with a cruiser screen. Such forces should be situated so as to be quick striking in the event of hostile attack on one of the bases. These forces would be especially valuable against enemy carriers when their presence is discovered by reconnaissance aviation.

We have many things in our favor. The small islands are usually very inaccessible and are thousands of miles from an enemy base. With blackouts in force they will be difficult to find even with the best of celestial navigation from aircraft. Enemy carriers can be kept at a relatively safe distance from the bases by a judicious use of patrol aviation and our own surface craft. Long radius submarines will be of extreme value here and can use the island base for refueling. Bases will also be of extreme value for friendly raiders.

In conclusion let the following principles remain paramount:

1. No small base can have a defense so strong that it will not suffer some bombing.

2. Protection must be afforded so that the base can withstand a protracted bombing attack.

3. Enough armament and troops must be provided to strike back effectively and to make an attack by air both costly and dangerous.

4. The base must be invulnerable to surface attack.

5. Protection against enemy carrier based aviation must be afforded in the shape of similar friendly aircraft.

Lightweight Assault Troops

By Captain A. L. Bowser, Jr., U. S. Marine Corps

AMONG the many volumes that have been written concerning the Allied landings on the Gallipoli Peninsula, is a simple statement that reads as follows:

"Some of the leading waves of troops, minus equipment, except for firearms, and clad only in shirt sleves, scaled the heights quickly and easily."

This particular phase of the operation was a landing at Helles, where the beach was narrow and rugged, and the terrain away from the beach, steep and difficult. Did the officer or officers in command of this particular phase of the landing purposely turn their troops into "light-foot" infantry; in order to facilitate effecting a difficult landing and traverse the rugged terrain? Or was it merely out of consideration for the effect of the hot weather on the troops? We shall probably never know. There is, however, a definite object lesson to be gained from the performance of these troops on this occasion. Unhampered by any heavy equipment, they landed at a difficult beach and demonstrated a speed of movement entirely unexpected over extremely rough and steep terrain.

Would these same troops, carrying packs, rations, and intrenching tools, have traversed the same terrain as quickly and easily as they did lightly equipped? The apparent answer is; no. A football player does not turn out on a basketball court wearing cleated shoes, padded pants, shoulder pads, and headgear. He equips himself with lighter equipment to play a faster and much different game. The initial phases, in particular, of a landing operation are as different a game from ordinary land warfare, as basketball is from football. Landing operations are admittedly a special task. We have developed, and are at present developing, special equipment for this task. But, have we developed any special type of troops or special type of tactics for landing operations? We train our landing force infantry in ship to shore movement and landing at the beach. We know there exists a bad defile at the beach, when attacking a defended beach, that spells suicide to the troops and equipment who do not clear it quickly. We carry out this training program with the plain, ordinary, unadulterated infantryman of the World War I type. He is equipped in the ordinary heavy infantryman's equipment and impedimenta. He is rather closely followed; sometimes even accompanied by heavy machine guns, difficult to debark at the beach and slow to get into action and past the beach defile.

It is the same kind of infantry that is trained and equipped to march long distances, make its own camp; and to a certain extent carry its own supplies. We require this infantryman, thus loaded down, to execute the difficult task of the assault landing waves. Whether he be a strong, hulking brute of two hundred pounds or a "sandblower," weighing 135 pounds "soaking wet" (which he probably will be), he carries the same weight of equipment. In making a landing under fire, he must debark from a boat into surf, half wade, half swim ashore; perhaps through or over natural and man-made barriers. When he arrives on the beach itself, it is usually heavy sand or rough stone, and this may be followed by rough and difficult terrain. All through these trials and at the end of them he must fight. Hard work? Decidedly. Possibly he would be a better fighter if we lightened his personal burden, to give him greater freedom of movement, and left him with some immediate fighting energy after he had attained solid ground.

World War II has shown, as no war before, that the execution of special tasks requires troops specifically trained and equipped to do that special task. Why not, then, for the special task facing us as a Marine Corps, a specially organized, trained and equipped, lightweight assault infantry? An infantry who, minus heavy equipment, both personal and organic, like the proverbial dropped "Tom-cat," will land running, and running fast, with sufficiently sharp claws to do some scratching of his adversary at close range with automatic short range assault weapons and equipment. This does not mean elimination of the standard "heavy" infantry. It will merely follow up the short jabs of the assault troops with the heavy punches necessary for any decisive knockout.

Let us discuss these special troops as to: (1) Basic organization, (2) Equipment, rations, uniform and arms, (3) Basic training and tactical employment.

(1) *Basic organization.* A battalion, consisting of two companies, one to precede each heavy infantry assault battalion of the assault regiments, should be an organic part of the infantry regiment. Each company should consist of a small company headquarters and two platoons. Each platoon should be organized as shown in Figure 1.

The weapons squads should consist of a total of fourteen men, organized as follows:

One (1) Sergeant: Squad Leader.

One (1) Corporal: Assistant Squad Leader.

Twelve (12) Privates: Riflemen and Grenadiers.

The squad can be maneuvered and commanded in action as a whole or it may be split into two smaller squads of six (6) each, with the sergeant in command of one squad and the corporal in command of the other.

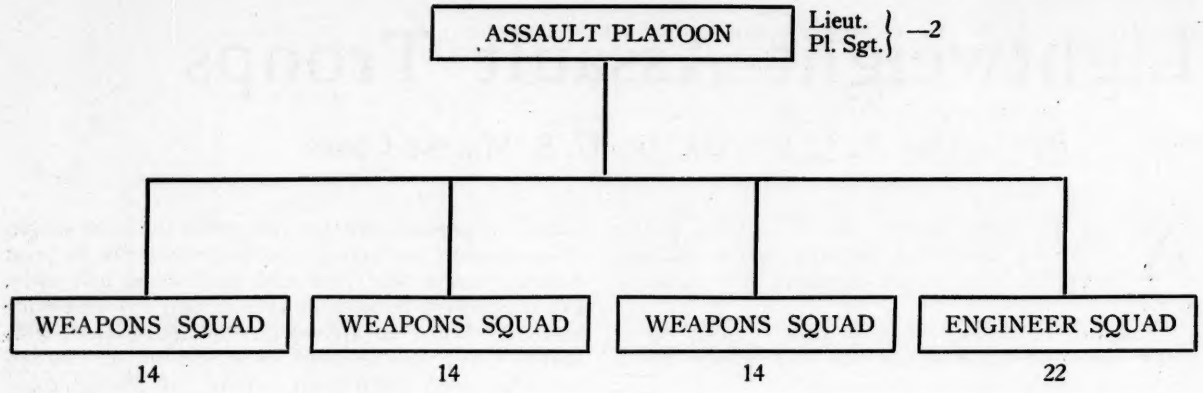
The combat engineer squad should consist of a total of twenty-two (22) men, organized as follows:

One (1) Sergeant: Squad Leader.

Three (3) Corporals: Assistant Squad Leaders.

Eighteen (18) Privates: Riflemen, grenadiers, and demolition carriers.

This squad can be split into two nine (9) men squads, or three six (6) men squads, with a corporal to command each squad.



TOTAL PLATOON—1 Officer; 65 Enlisted

Figure 1.

An alternative plan for organization would consist of having a company of these troops in each organic infantry battalion. This plan has the advantage of eliminating the necessity of an additional quartermaster section within the regiment. At least 50% replacements for these assault troops should be fully trained and ready for action; preferably 100%. The German Army maintains 100% replacement for their assault engineers.

(2) *Equipment, rations, uniform and arms.* The only personal equipment carried by these troops should be one canteen and a pair of wire cutting pliers. Their uniform can be dispensed with, by saying that it should consist of a steel helmet and the lightest possible clothing consistent with the degree of protection required by the climate in the theater of operations. Rations should be one or two "iron ration" chocolate bars. Next we come to the most important phase of the assault troops—the arms and equipment to be carried.

The function of these troops is to bring to bear a high volume of fire, combined with rapidity of movement; even though the fire be of short range and short duration, and to be able to blind and destroy, or partially destroy, defense installations, by attacking them from close range. As a covering force for the heavier units to follow, these troops can not be expected to wage an independent lengthy battle. Their arms then should possess the following characteristics: (1) Light weight and ease of carrying. (2) High rate of fire. (3) Heavy striking power at close range. (4) Ability to at least partially destroy solid objectives. The arms suggested for the weapons squads and those designated to carry them are as follows:

Sergeant: Automatic or machine pistol and a Very Pistol.

Corporal: Sub-machine gun and grenades, fragmentation.

Six (6) Privates: One sub-machine gun each and grenades; fragmentation and chemical.

Six (6) Privates: One automatic shot-gun (large gauge-heavy shot) each, and grenades; fragmentation and chemical.

Armed as above, the weapons squads have tremendous "close-in" hitting power, even though it is of short duration. They must be trained to take advantage of speed of movement and maneuver, conserving the bulk of their fire power until the right moment for its use. None of the weapons listed above are heavy or hard to carry. The amount of ammunition carried should be held to the minimum requirements of the situation, so as to avoid weighting down the individual men. The history of World War I shows that raiding parties against strongly held intrenchments were carried out successfully by patrols armed with sawed off shot-guns and grenades. At close range troops so armed have a heavy striking power, combined with quick movement.

The combat engineer squad of twenty-two (22) men cannot be as heavily armed individually as the weapons squads, since their major function is to act as "pioneers" or "sappers," and fire-arms carried by them are only for self-protection. Their carrying capacity must be utilized to transport, rapidly, demolitions and pioneer equipment. Their main task is to assault and destroy or render inoperative pillboxes, emplacements and tanks; and to breach barriers. Firearms suggested for this squad and those to carry them are as follows:

Sergeant: Automatic or machine pistol and a Very pistol.

Three (3) Corporals: One (1) sub-machine gun each and grenades.

Six (6) Privates: One (1) sub-machine gun each and grenades; chemical and fragmentation.

Twelve (12) Privates: One automatic pistol each.

In addition to the above arms this squad is to carry the following equipment:

(*Continued on page 64*)

CARDED

A Review of Camouflage Literature

By Lt. Colonel W. P. T. Hill, U.S.M.C.

PART IV.

THIS is the fourth of a series of articles recently published in The Marine Corps Gazette giving highlights of available camouflage literature. The first article below, "Provisional Technical Instructions on Camouflage," is translated from a French pamphlet on that subject issued by the Minister of War, and is similar to our Training Manuals.

Provisional Technical Instructions on Camouflage.

Minister of War. A pamphlet of 89 pages, 35 illustrations. Edition of 1926, reprinted 1937. Charles Lavauzelles & Co., Military Editors, Paris, France. Translated from the French.

The table of contents of this publication is as follows:

I. General Considerations.
Status of Camouflage.
Means of Camouflage.
Importance of Camouflage. Conditions of the efficiency.
Principles of Organization of the Camouflage service.

II. General conceptions necessary for the execution of the work of camouflage.
Visual and photographic reproduction of forms and colors.
Common considerations of Camouffage.

III. Description and properties of Camouflage Material.
Natural Means.
Artificial Means.

IV. Period of Movement.
Camouflage of Movement by Natural Means.
Camouflage of Movement by Artificial Means.

V. Period of Stabilization.
Camouflage of Movement by Natural Means.
Camouflage of Movement by Artificial Means.
Camouflage of permanent installations by Natural Means.
Camouflage of permanent installations by Artificial Means.

VI. Material of armor and observation supplied by the Engineer Service and generally installed in place by the attendance of specialized personnel.
Snipers' helmets and posts.
Protected observation posts and lookout shelters.
Dummy Shaft observation posts.
Tower observation posts.
Fire Directory ladders.
Fire Directory telescopic observation ladder Periscopes.

VII. Organization of the Camouflage Service.
Work performed by troops of all arms.
Work performed by specialized troops.

VIII. Method of Instruction.

IX. Camouflage Material.

(*Continued on page 52*)

CARDED

An Analysis of the Crossing of the Meuse River

By 2d Division A.E.F. on 10-11 November, 1918

By Lieut.-Colonel D. L. S. Brewster, U. S. M. C.

I AM confronted with the task of analyzing and criticising the events just prior to, during, and just subsequent to, the crossing of the MEUSE on the night of 10-11 November, 1918.

There was much caustic criticism and there still lingers in the minds of some not a little resentment for the Commander who ordered the actual crossing when an armistice was expected at any momnet and for the apparently needless sacrifices of lives.

For either side of this argument, records, reports and history furnish us with arguing points, but I would prefer to attempt to disabuse your minds of any thought that this operation was conceived with the idea of adding glory to any individual.

I believe that the basic principles of any battle can be likened in most respects to a school yard fight between two boys. They have a grievance and decide to fight. After a long tussle, A gets the better of B, and B feeling his strength waning says to A, "Let's stop and talk this over and see if we can't come to an understanding," and to himself he says, "When I get my breath and a little reserve strength, I'll be able to lick this fellow." Should A be a sap, or should he continue to drive home the attack until he has thoroughly beaten B? The answer is simple.

Let us get down to basic facts, and in doing so it is necessary to go back to 4-5 October, of 1918, when the news of the so-called false armistice was broadcast and there was rejoicing in every quarter.

To many Germans in authority, a peace based on President Wilson's famous fourteen demands was entirely acceptable, but Marshal Hindenburg had other ideas. It was at this time that he accompanied the Kaiser back to Berlin and persuaded the Supreme Headquarters that a levee in mass should be proclaimed in order to secure one last reserve for the defense of the frontier at the GRENZ position. The attempt was a failure and Hindenburg's scheme was merely to secure a peace by diplomacy while he held the Allies at bay and made their further advance so costly that they also would be inclined toward peace.

Whether the ruse behind these incidents was known at the time by the Allies, I do not know, but I cite it here to show that at that time the Allies placed no faith in the announced desires of the Germans and their every move was treated with suspicion. They were sparring for time and the Allies could not be fooled.

As early as October 28th, there was a meeting of the Allied Commanders to settle upon the terms which would be offered the Germans when the time came and these terms were so exacting that it was not expected that they would be accepted.

From this time until the news of the Armistice reached the combat troops there was constant talk of peace, much of which percolated into the ranks of the fighting men and none of which did any good for morale.

It remained, that hostilities were continued unabated; the Germans suffering from the hammer blows of the combined Belgian, French, British and American forces gradually fell back at the same time continuing their suit for peace.

On the evening of November 9th, Marshal Foch was in conference with the representatives of the German forces. Affairs in Germany were fast reaching a chaotic state and it was not known exactly who was in authority to conclude terms. Foch, still wary of the outcome of any negotiations and wishing to let the enemy know that there could be no further delay, dispatched the following telegram to Allied Headquarters:

"The enemy, disorganized by our repeated attack, retreats along the entire front. It is important to coordinate and expedite our movements. I appeal to the energy and the initiative of the Commanders-in-Chief and of their armies to make decisive the results obtained."

In response to this appeal from the supreme Commander, orders were immediately issued by General Pershing to give the enemy no respite, and as plans had already been drawn which provided for the crossing of the MEUSE, it does not seem to me that it was unusual for General Summerall, commanding the Vth Corps, to order the carrying out of the plans. Their execution only awaited a favorable opportunity when the bridge material could be placed in position for the crossing.

It is quite true that in some instances, attack orders were not carried out and half-hearted attacks bogged down for want of the necessary aggressiveness which latter spirit was only caused by the dissemination of false rumors. Still, other leaders were jubilant because, as it later developed, they had spared further bloodshed.

As the momentous events developed, this was all very well, but what would have happened if the entire battle line from the Swiss border to the North Sea and laid down on the job for want of offensive spirit? The question answers itself, for it was all that the German commanders in the field wanted, to demand a stouter resistance by their troops and even offensive operations, and the bloodshed would have been a hundred fold greater.

In the forest between COMPIEGNE and SOISSONS the representatives of the Central Powers and the Allies again met on November 7th. The German delegates had no authority to definitely conclude the terms of an armistice and it was necessary for them to refer the matters to Berlin for approval. Upon learning the demands of the Allies, a German delegate was sent to Berlin with the terms.

At 11 P. M., on the 10th of November a wireless message was received in code from Berlin, authorizing the German delegates to accept the terms and sign the Armistice. The decoding of the message took a considerable time and it was not until 5 A. M. on the 11th when it was finished, and the discussions were completed sufficiently to draw up the terms in rough. Even at that, the final page was completed first in order that word could be disseminated to the fighting troops to cease hostilities, in order that lives might not be needlessly sacrificed.

Remember this, that in spite of the fact that the American First and Second Armies occupied a front of some eighty miles, most of the units were notified before 11 o'clock on the morning of that memorable day. Compare that with our present day claim for efficiency in communications when we determine that it will take some three hours for a mere brigade to get orders down to their companies, and here had been a fast moving situation where even the supply facilities could not keep up with advancing infantry. Let us now get down to the matter in hand: that of an analysis of the operation of the 10th-11th November.

The 2d Division, consisting of the 9th and 23d Infantry and the 5th and 6th Regiments of Marines were fresh from their victories at BLANC MONT. On November 1st they had been moved by truck and marching to become a part of the Vth Corps under General Summerall. The Hagen and the Grentz positions had been carried and part of the Kremhilde or, better known Hindenburg line had fallen into our hands and the Germans, on the night of 4-5 November had fallen back to the north bank of the MEUSE.

German resistance to the impetuous attacks of the Americans was weakening and their only hope lay in getting the remnants of their forces to the rear where a new defensive line could be formed. The crossings of the MEUSE therefore were left in the hands of a composite force consisting of trainmen, signalmen and even clerks from Division Headquarters, who manned the machine gun defenses. The German artillery however was farther to the rear and since it was falling back on its supply line, there was no dearth of ammunition.

On the 6th, the 2d Engineers under Colonel Mitchell

(Continued on page 51)

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Hilton Head and Port Royal, 1861

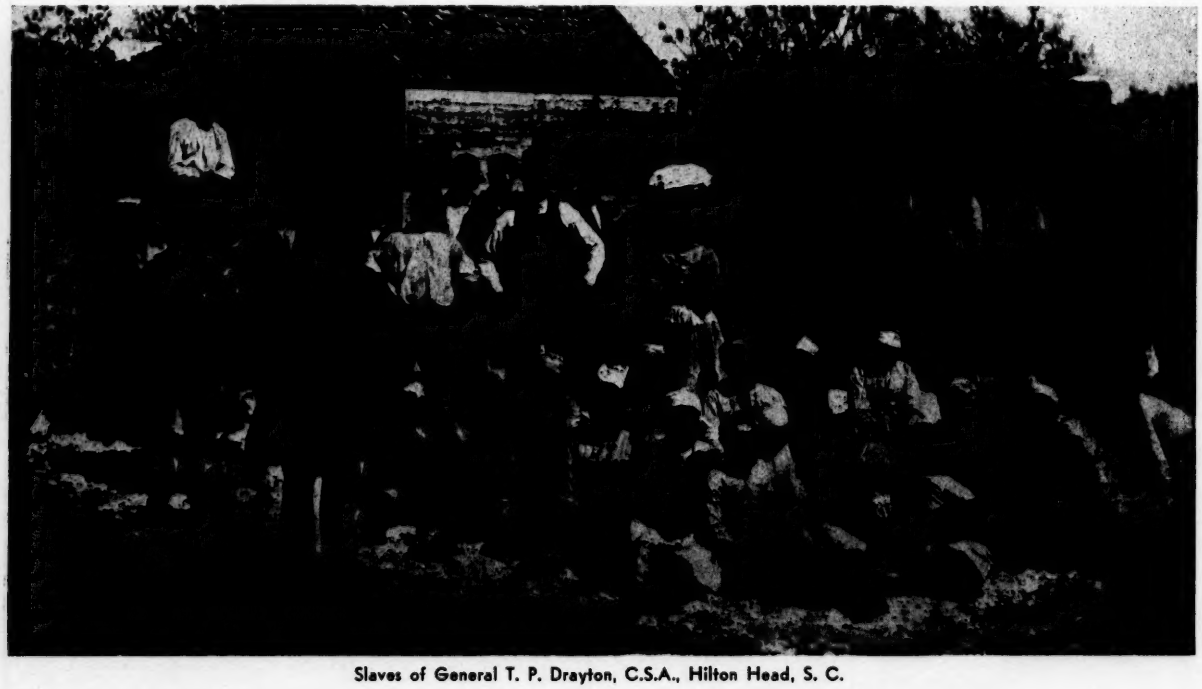
By 1st Lieutenant R. D. Heinl, Jr., U.S.M.C.

FEW of the intent motorists who drive daily through Washington's Dupont Circle have ever heard of Hilton Head Island, South Carolina. Even in the Marine Corps and the Navy, which have twice occupied the island, the association is obscure, although it was the reduction, in 1861, of Hilton Head's fortifications, by Admiral Dupont, that won him his reputation and Washington a name for its loveliest of circles.

With Hilton Head again occupied by Marines (defense battalion troops in training), the story of Hilton Head and Port Royal will bear recounting.

In October, 1861, projects to accomplish the vast blockade of the Confederacy had been realized to the extent that Flag Officer Samuel F. Dupont, U. S. Navy, had been given discretionary orders and a combined Naval force with which to seize any one of several southeastern Atlantic coast points within the Confederacy. He was accompanied by a Marine Corps provisional battalion of 385 officers and men, embarked in a single transport, and an Army force totalling 12,000, under Brigadier General T. W. (*not* William Tecumseh) Sherman. Dupont's squadron consisted of two frigates, three sloops, nine gunboats, and a sailing-sloop ("jackass frigate" was its colloquial apellation) which was to be towed by an armed auxiliary. It was with sealed orders that the force—including transports and train, fifty in number—sailed on 29 October from Hampton Roads. Four possible objectives had been selected by the Navy Department upon recommendation of a joint board, composed of Flag-Officer Dupont; Professor A. D. Bache, the Superintendent of the U. S. Coast Survey, an able hydrographer and pilot; Major (later Major-General) James G. Barnard, of the Army engineers, who was to complete the great ring of fortifications surrounding Washington; and another Naval member, Commander C. H. Davis. The objectives, ranging from Fernandina, in Florida, to Bull's Bay, St. Helena and Port Royal Sounds, all in the coastal "Low Countries," were of approximately equal importance for the purpose of affording strategically located shelter and basin-facilities for units of the South Atlantic Blockading Squadron, and it was only after the expedition was underway that a final decision as to its destination was reached. Port Royal Sound was selected.

From its earliest settlement, during the Seventeenth Century, Port Royal Sound and adjacent islands had afforded convenient and safe shelter for seamen. Further, the network of creeks and inlets adjoining had made it as attractive to pirates, slavers and adventurers as it was to prove for blockade-runners. The towns of Port Royal and Beaufort, both well-known to present-day Marines, were then flourishing ports for the shipment of Sea Island cotton grown on the plantations which occupied the islands. Beaufort, even more then than today, was the capital of the region, a city whose future, many believed, would outrun that of Charleston; Bay Street's vista of town houses, and

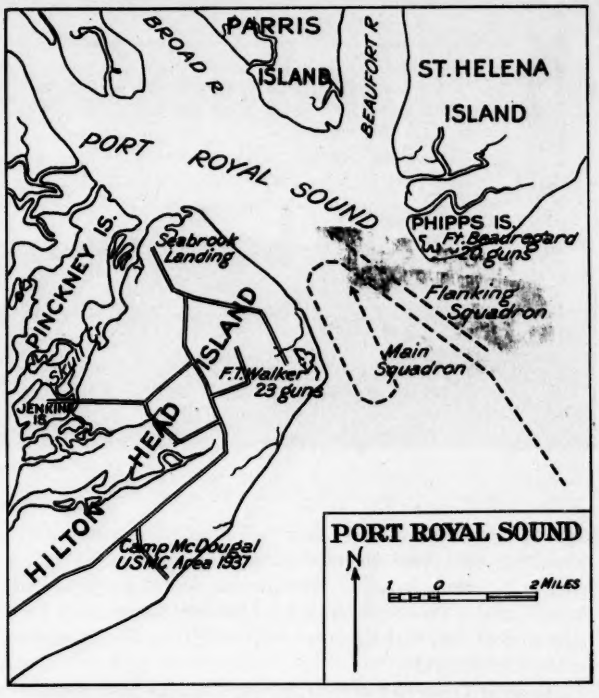


Slaves of General T. P. Drayton, C.S.A., Hilton Head, S. C.

St. Helena's Church, survive to indicate the grace and amplitude of Beaufort as it was.

The principal entrance to Port Royal Sound lies between Hilton Head and Phipps (misnamed *Phillips* in Civil War reports) Islands. Hilton Head, large and well-cultivated, is the military key to the Sound. It had been settled as early as 1700, and was, until 1861, the seat of numerous plantations and communities whose ruins can now be discovered at the cost of some effort and curiosity. It had served as a clearing-point for traffic in contraband slaves from Africa until very shortly before the Civil War, and many of its negroes, like those on other remote Sea Islands, were far less "civilized" or adapted to American ways than any in the Confederacy. Their dialect, Gullah, and the variants encountered on Hilton Head, was incomprehensible to many whites, as it is to this day. Despite Hilton Head's remoteness, however, it had behind it in 1861 a century and a half of continuous cultivation by Low Country landowners of the best type.

Both Hilton Head on the south, and Phipps Island, on the north, had been fortified by G. T. Beauregard's Confederate engineers under the general supervision of General R. E. Lee, who, at this time, was charged with engineering direction of the coastal defenses of this area. Fort Walker, located on Hilton Head, contained twenty-three guns, ranging in caliber from eight to ten inches, including howitzers, columbiads, and Dahlgren guns. It was a strong earthen field-work, timbered with palmetto-logs, traversed (though not as adequately as might have been, reported Union officers who visited the site after its capture), and supported by an exterior demilune, mounting a single gun covering the right southeast flank of the fort. Fort Beau-



Present-day Marines will recognize the lower end of Parris Island and the terrain of Hilton Head, whose road-net as shown includes only those roads which are now existent and which figured in the Civil War occupation of the Island. Approximate courses of Dupont's two squadrons are shown by dotted lines. It will be noted that Seabrook Landing is not located on Jenkins Island (the present landing in use by the Marine Corps), as is supposed by many.

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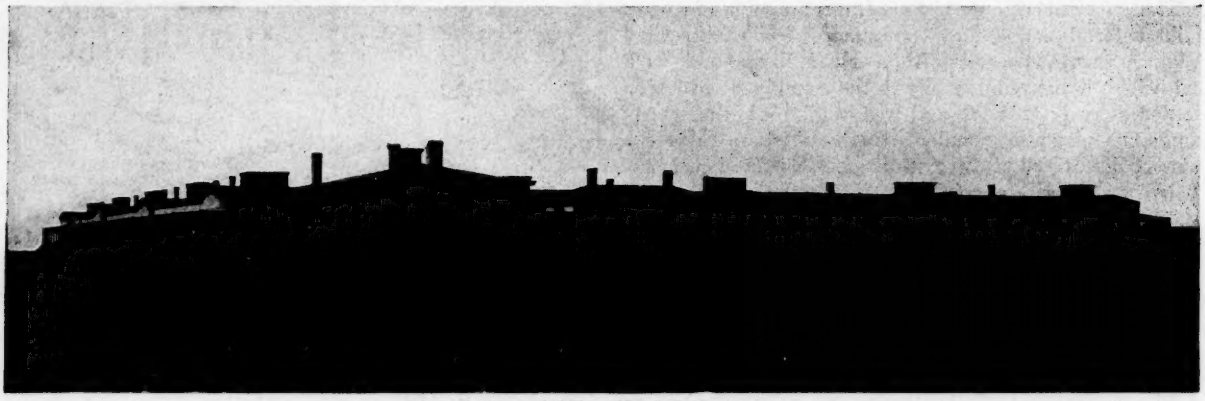

Hospital, Hilton Head, S. C.

regard, on Phipps Island, was of somewhat less strength, though it contained twenty guns, divided into a "main battery," "sand battery" (emplaced amid a group of dunes), and a "hot-shot battery." Construction of each had been undertaken during July, 1861, with an initial appropriation of $15,000.

Brigadier General Percival Drayton, C.S.A., commanded the defense of Port Royal Sound, with headquarters at Fort Walker. He had, when attacked, approximately 1,700 oficers and men, all from South Carolina and Georgia and most from the immediate vicinity. At Bay Point, as the Phipps Island site was known, Fort Beauregard was within the command of Colonel R. G. M. Dunovant, C.S.A., but the fort itself was commanded by Captain Stephen Elliott, a native of the region and representative of a family which had lived continuously in and about Beaufort since its earliest days. The family continues in existence, and the Elliotts are well known to many of Parris Island's Marine officers. Dunovant's force totalled 619.

Dupont's expedition arrived off Hilton Head on 4 November, 1861, after mishaps which would have deterred a less determined and energetic commander. A Hatteras gale, encountered on All Saints' Day, 1 November, had scattered the fleet of transports and occasioned the loss of one, the *Governor,* which unfortunately had embarked what Dupont characterized as "our fine battalion of Marines," under Major John G. Reynolds. The *Governor* disaster, and the eleventh-hour rescue of the Marine Battalion by the U.S.S. *Sabine,* deserve a separate account. Here, it must suffice that the transport's crew were "very, very worthless. The chief engineer and the chief mate conducted themselves as cowards and traitors only know how"; that, after exhausting the ship's supply of pyrotechnics in fruitless distress-signals, the Marines were succored by Naval vessels which dicovered their plight by sheer good luck; and that Major Reynolds and his officers received high commendation from Dupont for their behavior. Major Reynolds "disputed" with the *Governor's* master (a Navy officer), the right of last leaving the ship.

On 5 November, despite intermittent fire from the Confederate forts, and, worse, the absence of any navigational aids, which had been removed on the outset of hostilities, the lighter transports, convoyed by gunboats, made their way into Port Royal Roads. Assisted again by a Coast Survey hydrographer, Dupont shortly had the channel sounded and buoyed (under fire), and, with seamanship remembered years after, got his flagship, the frigate *Wabash,* across the bar with one foot of water under her keel. Meantime, the gunboats had undertaken a reconnoissance in force, with a view to ascertaining the weight and fields of fire of the forts. At this juncture appeared Commodore Josiah Tatnall, C.S.N. ("Blood is thicker than water," he had remarked, in 1859, when he took a U. S. sloop into action in support of a British gunboat under Japanese fire). Tatnall's force was pathetically weak, three converted river-steamers; but his reputation for "courage and plan," as Dupont observed, was formidable. An eleven-inch high explosive shell, fired at long range by Lieutenant-Commander Daniel Ammen, U.S.S. *Seneca,* lodged in the hull of one of Tatnall's steamers without bursting. For Tatnall, the implication was plain, and, outgunned for the day, he withdrew in the direction of Skull Creek. What had been learned from the day's work was that the forts were "works of strength, and scientifically constructed," and that, with Tatnall on hand, the transport fleet deserved special protection against surprise.

Unfavorable winds kept Dupont inactive on the next day. In addition, his scattered squadron was not yet completely assembled. The frigate *Pocahontas,* one of his most powerful vessels, commanded by a South Carolina officer who had remained loyal, had not arrived. Those who suspected her captain, Commander Percival Drayton, of lukewarm allegiance, noted that the Confederate commander ashore was Drayton's brother.

Dupont determined to attack on 7 November, and thereupon divided his force into a main and flanking squadron, the former to be composed of all warships except the absent *Pocahontas* and a division of five gunboats assigned to the latter. At 8 A. M. signal was made to get underway, and, at 9 A. M. the main squadron stood past the forts in column which passed close aboard Fort Walker. One of the Hilton Head guns began the action at 9:26 A. M. Dupont's maneuver from now on was to steam up the Sound inside the line of forts, turn his column 180 degrees to the left, and close Fort Walker on its weaker face inshore, while enfilading the stronger seaward faces. Moving slowly down, the squadron subjected Fort Walker to a merciless fire at an average of 600 yards. By 10:30 A. M. the

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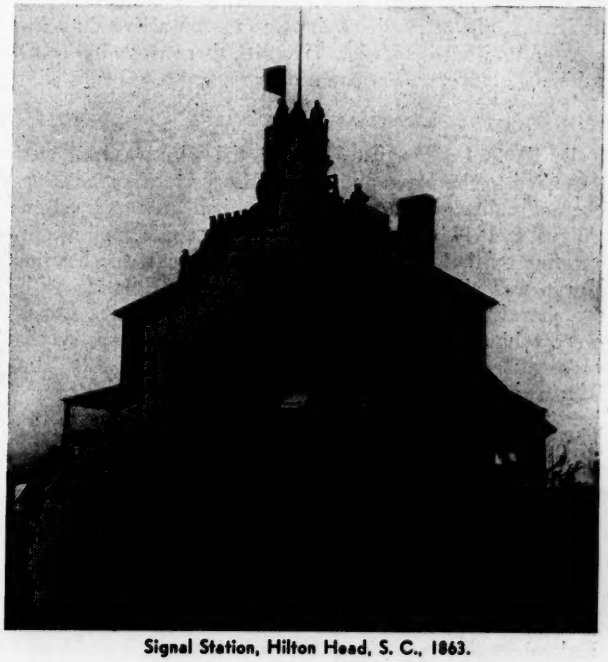
Confederate gunners, who were returning a vigorous fire, were so fatigued that General Drayton had to employ infantry reserves to man artillery in Fort Walker. At 11:30, Navy signalmen reported that the Fort's colors had been shot away. At the same time, a sail was sighted to seaward, apparently bearing down on the entrance with all speed. Dupont made it out to be the *Pocahontas,* struggling to arrive in time. As she stood in, not having been assigned a station in the line of battle, her captain brought her under the heavy guns of Fort Walker's seaward face at almost point-blank range, and laid so rapid a fire into the works that his main battery had to check fire to cool and clean the bores. He then attacked Fort Beauregard with equal energy. His brother ashore survived the bombardment.

The flanking squadron's mission was primarily to neutralize or destroy Commodore Tatnall's force, so that the transports could not be stricken by a sudden sally during the height of Dupont's engagement with Fort Walker. Tatnall stood down to meet the squadron, having ordered his quartermaster, "Dip my broad pennant to my old messmate, Dupont." A few moments' action again demonstrated how completely the Confederate ships were outmatched, and though Tatnall made another sally during the morning, he finally retired into Skull Creek, whose waters are familiar to all Marines who have made the ration or liberty trip from Parris Island to Hilton Head.

At 1:15 P. M. Fort Walker ceased fire, with most of its ammunition expended and works partially demolished. Fort Beauregard had received incidental attention from the main and flanking squadrons to such an extent that when it could be observed from Bay Point that Hilton Head was out of action, abandonment of the works was immediately ordered. Meanwhile, General Drayton had organized the Hilton Head forces for a withdrawal, although no landing was as yet in progress from the fleet. After 2:00 P. M. the Marines and seamen of the *Wabash's* landing-force, under Lieutenant-Commander C. R. P. Rodgers, secured Fort Walker without opposition and began setting matters to rights for the Army, which landed later in the day. That General Drayton's retreat toward Seabrook Landing was not interrupted, nor his crossing to the mainland, was due to misinformation. Within the abandoned works were found all the evidences of a hasty retreat: baggage and tentage adrift; officers' swords and even commissions. A few dead attested the defensive strength of the fort which had stood the combined fire, amounting to thousands of major-caliber rounds. The killed, wounded and missing in Hilton Head totalled but 66. Dupont's casualties were 31. At Bay Point none was killed, although Captain Elliott was wounded by a shell-fragment.

Reconnaissance of adjacent sounds and waterways revealed that the civil population had abandoned their lands and slaves, and set fire to cotton stored. The great houses on the plantations were already at the mercy of slaves and vandals. Forces which reached Beaufort found nothing but "one drunk Irishman" (whom a U. S. Naval officer brought back to Dupont) and numerous confused negroes. Flag Officer Dupont took immediate measures to restore order and get the slaves under some sort of control. In Beaufort, at least one naval officer noted damage already done, and left a memorandum for the absent owner of a home, setting forth its condition when U. S. forces had arrived, and expressing hope that the destruction would not

(Continued on page 50)



Signal Station, Hilton Head, S. C., 1863.

AS IT WAS BEFORE

(In 1917-1918)

By J. C. Jenkins

(Strength, Inductions, Officers, Training, and Aviation, 1917-1918)

THE act of Congress, approved August 29, 1916 (just seven months prior to the entrance of the United States into the war) authorized in emergency an increase in the strength of the Marine Corps from approximately 13,000 officers and men, to 693 officers and 17,400 enlisted men. During the war, further temporary increases were authorized, raising the total authorized strength of the regular Marine Corps to 3,341 officers and 75,000 enlisted.

The actual strength of the Marine Corps on active duty April 6, 1917, was: 462 commissioned officers, 43 of whom were regular commissioned retired officers on active duty, 49 warrant officers, and 13,214 enlisted men.

The active duty strength of the regular Marine Corps personnel, at its peak on December 11, 1918, was 1,722 commissioned officers including 44 retired officers on active duty, 257 warrant officers, and 65,666 enlisted men. Also, on active duty at the time, were 452 reserve commissioned officers, 31 reserve warrant officers, and 6,973 enlisted reserves (the latter including 270 female reservists)—a grand total of 75,501, which was 2,238 in excess of the total active duty strength on November 11, 1918.

The Act of August 29, 1916, establishing the Naval Reserve Force, also established a Marine Corps Reserve. On April 6, 1917, there were enrolled in the Marine Corps Reserve, subject to call to active duty, three officers and 36 enlisted. The strength of the Reserve on active duty increased until on November 11, 1918, there were 463 commissioned officers, 33 warrant officers, and 6,760 enlisted.

Draft and Inductions

By the Act of August 31, 1918, the selective draft was extended to the Navy and Marine Corps. In anticipation thereof, enlistments and enrollments had been stopped on August 8, 1918, except in the case of bona fide applications pending on that date. Under the regulations, the Marine Corps was allotted quotas for induction, beginning with October 1, 1918. All inductions into the Marine Corps were voluntary and subject to usual Marine Corps standards. The total number of inductions was 7,088. The Marine Corps requested no more inductions after November 18, 1918, and on December 4, 1918, recruiting in the usual way was resumed on a very limited scale.

Marine sections of the Students' Army Training Corps were established at ten colleges and universities, with a total quota of 1,500.

Naval Militia

The enlisted strength of the Marine Corps branch of the Naval Militia on April 6, 1917, when mustered into the Federal service as National Naval Volunteers, was 24 officers and 928 enlisted men. There was no recruiting for the Marine Corps branch after April 1, 1917. On July 1, 1918, the Marine Corps branch of the National Naval Volunteers was consolidated with the Marine Corps Reserve.

Officers

Officers, permanent and temporary, commissioned in the regular Marine Corps from April to October, 1917, were drawn from the following sources: graduates of the Naval Academy 6; warrant officers 89; noncommissioned officers 122; Reserve officers and National Naval Volunteers 36; graduates of military colleges 284; other civilians with military or naval experience or training 136; civilians selected by competitive examination held July 10, 1917, 86; miscellaneous 2.

The newly appointed officers were ordered to several depots until the completion of buildings at Quantico, Virginia in July, 1917, when 345 of them were assembled there for an officers' camp of instruction, completed in October, 1917. After that, no further appointments of civilians were made and, except for graduates of the Naval Academy, all officers were appointed from the noncommissioned grades as the result of systematic selection and training. The first training camp was held at Quantico April-July, 1918, resulting in 391 commissions. A similar training camp was conducted for the Marines in France, resulting in 164 commissions. The second training camp at Quantico, August-December, 1918, graduated 430, and the Army candidate school in France 172. These graduates were commissioned in the Reserve and subsequently given temporary appointments in the Marine Corps. From the third training camp at Quantico, there were graduated 235 in July, 1919, who were commissioned in the Reserve and at once placed on inactive duty status. There were also 48 graduates of the Army candidate school in France who were commissioned in the Reserve and discharged or placed on inactive duty status upon their return to the United States, with the exception of four who were transferred to temporary service.

Sixty-nine officers graduated from the Marine Corps school of machine gun instruction at the plant of the Savage Arms Company at Utica, N. Y.

Recruit Training

The Marine Corps recruits received a comparatively brief but thorough training. The basic training was conducted mainly at the two regular recruit depots—Parris Island, S. C., and Mare Island, Calif., which were greatly enlarged in size and scope, with total number of recruits 46,202 and 11,900, respectively. The period of training at the recruit depots varied from eight to twelve weeks,

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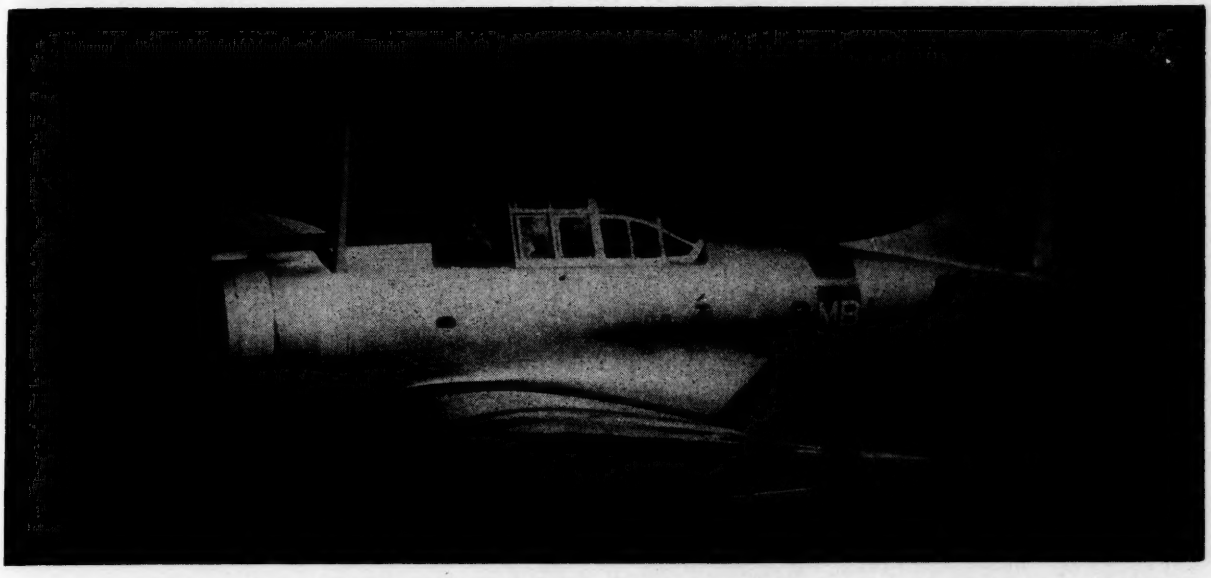


Marine Corps dive bomber, SBD-1, being flight tested by Comm. Leland Webb of the Navy office. Photos by Harold Jackson

"From the Halls of Montezuma"

Marine Corps Takes Delivery of Douglas Dive Bombers

Courtesy "Douglas Airview," November, 1940

THEY are called "leathernecks" because some hundred years ago their uniforms included leather collars. They are called "devil dogs" because they are hardy citizens, able to lick their own weight in wildcats. They are the United States Marines, the "soldiers of the sea" who probably, man for man, have seen more action in more places than any other of the nation's military services.

Sharpshooting Marines, perched in the shrouds, in the crow's nest, and clinging to the spars of the *Bon Homme Richard* off the coast of Scotland in 1779 helped famous John Paul Jones to victory over the British *Serapis*.

In 1832 the Marines battled and defeated bands of pirates preying on American shipping in Sumatra in the south Pacific ocean. They fought and won engagements in Ethiopia (1903), in the Falkland islands off the tip of South America (1831), and in the Bering sea (1891).

Wherever the American flag flies, whether in time of war or in time of nominal peace, the Marine Corps prides itself in always being handy to protect the nation's vital interests. "Semper Fidelis," always faithful, reads its motto. "From the halls of Montezuma to the shores of Tripoli," begins the corps' hymn.

Cargo transport used by Marine Corps is Douglas R3D-2. Four are in service transporting men and equipment for the famous "soldiers of the sea."

It was just 165 years ago, in November, 1775, eight months before the signing of the Declaration of Independence, that the Continantal Congress, meeting in Philadelphia, created the United States Marine Corps. And on its 165th birthday the Marine Corps received delivery from El Segundo plant of the Douglas Aircraft company of the last ship of a substantial order for powerful dive bombers, the peer of any such type ship in the world to-

day. For, like the Army and the Navy, the Marine Corps today is rapidly expanding its manpower from the 17,000 in 1938 to 38,600 nearly reached today and expanding its equipment until it is second to one.

With this newly expanded, powerful fighting force aviation will play a part of supreme importance because speed in attack has long been the principal basis of Marine Corps operation. Marines were the first U. S. troops to land in Cuba in 1898. The first U. S. shot in the World War I was fired by a Marine across the bow of a German cutter in the harbor of Guam. Should trouble arise again, wherever it may be, the Marines plan to get there first with the most men and equipment. Leading any such operation might well be a squadron of SBD-1s, Douglas scout-bombers, the basic model of the SBD series, the most powerful ship of its type in the air today, one that will be used by the Marines, the Army and the Navy.

Marine Corps personnel attended El Segundo service school for SBD-1s. Standing, Sgts. Martin Van Boskirk, C. F. Finnie, C. P. King, Leroy Dailey, Francis Werner, W. J. Lane, Master Sgt. John Gerey. Seated, Sgts. C. V. Farmer, L. J. Ennes, J. V. Sillasen of Douglas, Master Sgt. H. A. Papen, N. Goeltz of Douglas.

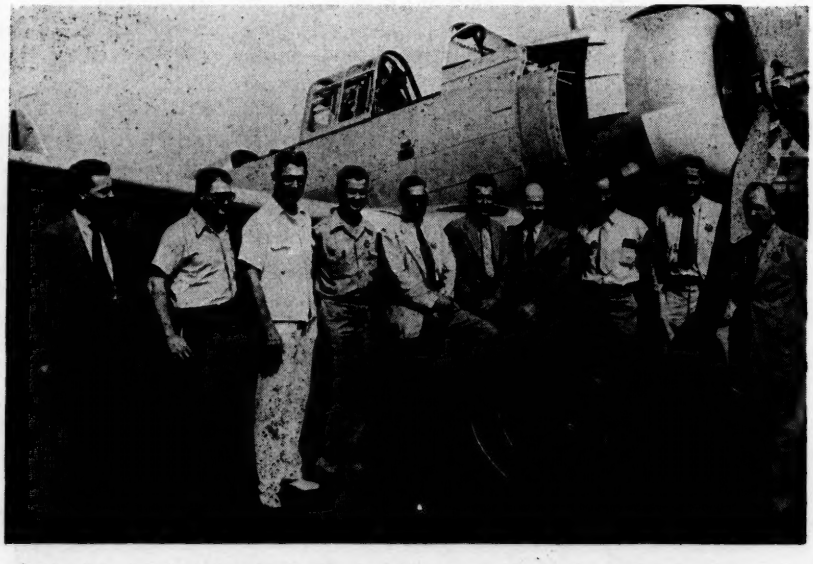
The SBD-1 is a single engine, low wing monoplane with fully retractable landing gear. It carries a crew of two, pilot and gunner, and is provided with all the most recent developments in military aviation, including crew protection against gunfire and unusual perforated dive flaps or "brakes" which retard diving speed and assure more abrupt pullouts and greater bombing accuracy.

In every respect the SBD-1 is superior to the most talked of airplane which has yet seen service in the European war, the Ju 87 Stuka dive bomber of the German air force. The SBD's range is greater, its load carrying capacity, including more than half a ton of bombs, is greater and its speed is greater. Complete machine gun equipment protects it from attack from all sides.

Delivery of the first production model of the Marine Corps order was made last July and at an ever-quickening tempo they have been coming from the assembly line of El Segundo plant ever since. As they came from the line, each and every ship, already inspected by Navy inspectors and Douglas inspectors during every phase of its construction, was thoroughly flight-tested by Comm. Leland D. Webb, chief of the staff of naval inspectors at Douglas. Commander Webb reported the diving characteristics of the airplanes to be exceptionally good and said they are extremely maneuverable.

After the thorough inspection and flight testing the airplanes were delivered to the San Diego Naval Air Station and then ferried to the First Marine Aircraft Group at Quantico, Virginia. After pilots there have familiarized themselves with the airplanes they will leave for distant bases, somewhere "from the halls of Montezuma to the shores of Tripoli."

Before the ships left El Segundo, however, the Marine pilots, mechanics and service men were becoming familiar



Service School students from Marine Corps and instructors, Maurice Faugh, Douglas; Sgts. G. T. Perchel, G. Cole, E. P. Frazer, Major J. Smith, Sgt. N. T. Johnson, N. Goeltz, Douglas, Sgt. W. Woodruff, Lts. G. H. Bell, K. D. Kerby.

XUM

with the design, construction, operation and maintenance of the SBD-1s through a service school conducted at the Douglas plant under the supervision of C. T. Reid, director of the education department, and experts of the El Segundo plant.

Eighteen men, including Major N. Smith, First Lieuts. Gordon A. Bell and Kenneth Kirby and Master Technical Sgts. George Cole, William F. Wilson, Herman A. Papen and John Gerey attended the service courses at the plant. The instruction included lectures by various engineering and shop specialists, conferences, plant tours, aircraft movies and question and answer sessions. The U. S. Marine Corps, probably the least understood by the general public of the armed forces of America, is in effect an independent land army which augments the strength of the Navy. It supplies a small but highly trained, highly mechanized and extremely mobile fighting force which includes infantry, light and heavy artillery, tank corps, and aviation units.

The Marine Corps is an organization independent of the Navy, though it functions under the Secretary of the Navy in the President's cabinet. Its operations, however, are closely linked with those of the Navy. The Corps has a detachment on every battleship and aircraft carrier, all the heavy cruisers and the new light cruisers as well as on some other craft.

Recently, under orders of Secretary of the Navy Frank Knox and Major General Thomas Holcomb, Marine Corps commandant, organization of the first two full divisions in Marine Corps history was begun. Streamlined to the nth degree and equipped with the most powerful and mobile weapons, the two outfits are designed especially for lightning thrusts into troubled areas. Six fast Navy destroyers, refited to transport 200 men and their equipment, will enable fighting units to steam to combat at 30 knots.

Also in line with its policy of speed and mobility, the Marine Corps has acquired four R3D-2 cargo-transport airplanes from El Segundo plant. These cargo ships, a revised version of the DC-5 commercial transport, were especially designed to carry large aircraft engines, propellers and other heavy freight. Special handling equipment, including hoists and loading platforms carried by the airplane make it possible to load and unload cargo at any place an airplane can land and get off the ground regardless of field equipment. In addition, provisions were made for installing passenger seats to convert the airplanes into 16-passenger transports.

Delivery of these airplanes was completed several months ago and all are now in service. In use on the West Coast, two of the airplanes have made several nonstop flights from San Diego to Seattle in less than seven hours. The ships have a high speed of more than 220 miles per hour and carry useful loads of more than 7,000 pounds.

No simple task lies ahead for the Marine Corps fliers today. Nobody knows where or on what sort of an assignment they might have to go next and for that reason they must be prepared for anything. And preparing they are, in Tientsin, in Portsmouth, N. H., in Shanghai, Alaska, Guantanamo Bay, San Diego and Quantico for whatever task they might have to perform.

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A Critique of Reserve Training

By Captain Ben Stern, U.S.M.C.R.

"DRILL is necessary to make a soldier steady and skillful, but it does not warrant exclusive attention. Among all the elements of war it even is the one that deserves the least."

So wrote Marshal Maurice de Saxe some 200 years ago and if the tactics exemplified by the German armies of specialists in their undeterred march across Poland and the low countries are to be accepted as reliable criteria, then this great eighteenth century soldier and tactician gave voice to a fundamental axiom.

None would challenge the fact that drill makes for coordinated action, but does the training of the modern soldier end there?

Apparently not, if credence be given the emphasis placed constantly on the need for skilled technicians in the armed forces and the editorial clamor for an "army of mechanics."

And it is with that problem toward which this sketchy critique is directed in relation to the training of the officers of the Marine Corps Reserve and its enlisted personnel.

Under able, energetic and sympathetic encouragement from the regular establishment there has been developed for the Corps a most potent and valuable asset in its 23 Reserve battalions and its 1,200 officers, divided into some 300 serving with organized units and 900 unattached in the Volunteer status.

The 23 organized battalions are composed of 21 infantry units and two artillery, the 7th in Philadelphia and the recently organized 22nd in Los Angeles.

Anyone at all acquainted with the training of the Reserve battalions is cognizant of the large amount of time devoted to drill and musketry, the fundamentals of being a Marine.

But should so useful an asset as the Reserve be limited and circumscribed in its potential value to those very subjects so adequately and admirably exemplified by the regular establishment?

Because of its comparatively small size in contrast to the scope of its mission, the Marine Corps must in itself be a thoroughly integrated unit with the various specialized groups necessitated by modern military science smoothly functioning components of the whole.

In its very self, the Marine Corps can prove the contention of Saxe that "it is not the big armies that win battles; it is the good ones."

And it is in the field of specialization, with the goal making this true of the Marine Corps, that the Reserve can be made the asset which its creators obviously intended.

The basis for such an achievement necessarily rests first upon the Reserve officers.

In accordance with the personnel designations now in force, all Reserve officers with the exception of those assigned to the thirteen Reserve Squadrons, are commissioned in the line.

Available to them at the schools are three correspondence courses, the Basic, the Junior and the Senior Reserve.

All three are of the utmost value, but after he has completed these studies, and they are by no means simple, then in what direction is the Reserve officer headed?

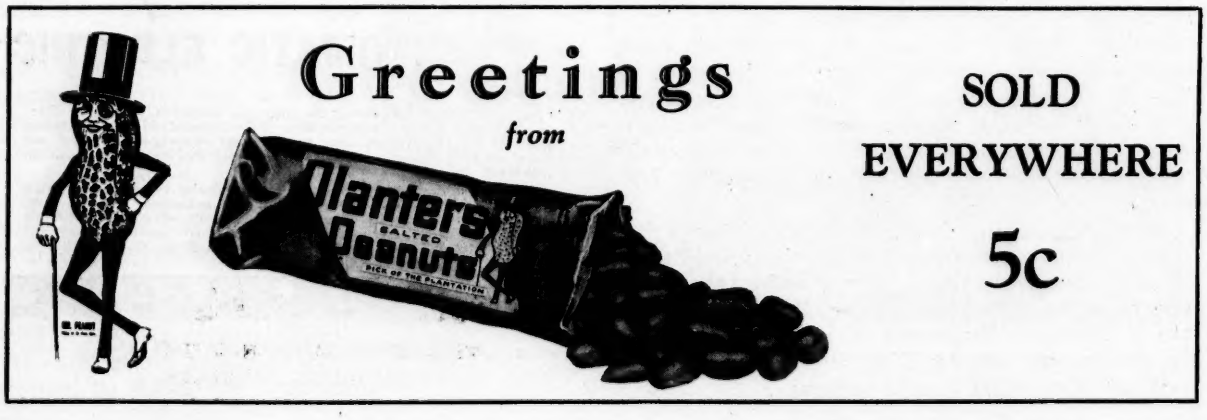
Under the present scheme of things—no where.

Then why not open avenues of study and training which will make of the Reserve officer a specialist in a field in which the regular establishment has and is experincing a great dearth.

As a primary requisite every officer should and must enroll and complete the Basic and Junior courses.

These are the elementals in the making of an officer. Through these he learns to speak and understand the language of the profession.

Through these he becomes qualified for the performance of his basic duties as an officer.



Upon completion of these two courses (Basic and Junior) the officer is ready to embark upon specialized studies.

Let us for the sake of this argument consider the case of the entirely mythical Reserve Lieutenant John Smith, who has been graduated from these studies which are the present requirement for promotion up to and including the rank of Major.

He thus is acquainted with the fundamentals of his profession.

Lieutenant Smith's civilian activities are as an engineer or an architect, why then should not the Corps avail itself of this training and Lieutenant Smith be permitted to enroll in a course in military engineering, instead of continuing with the Senior Reserve course and thus devote his time to a series of professional studies which in all probabilities he never will require?

If Lieutenant Smith is an attorney (and a large number of Reserve officers are members of the bar) but his leisure interests are in radio and communications, then he should be offered an opportunity to enroll in correspondence courses in this or any other phase of the profession toward which he is inclined.

His training should not end with the mere correspondence courses, but when he is ordered to active field training, let it be with a regular unit engaged in the performance of these activities.

The courses offered could and should embrace every one of the subjects of modern military science.

Obviously there will be those ready to point out a material handicap—the absence of such courses in the curricula of the Marine Corps Schools.

At the present time the schools are negotiating with the Army Artillery School at Fort Sills for texts for Reserve officers performing duty with their two artillery battalions. Why therefore can not other courses be obtained for those desiring to specialize?

If this be neither practical nor desirable because of the comparatively small number of officers who will be enrolled in the various courses in proportion to the amount of the work involved in their preparation, then why can not arrangements be made with the army so that the officers be enrolled in the army correspondence school and upon completion proper certification be made to the Marine Corps Schools?

Even mere cursory study will reveal that the possibilities are limitless and mere technical handicaps should not deprive the Corps of so useful a resource as adequately trained specialists, which today are so vital a need of every military unit.

Similar training can be provided in the Reserve which at the present time suffer from, what for want of a better designation, may be termed "training dullness."

Under the training schedules in force, various weekly drill periods are set aside for lectures and demonstrations of infantry weapons. These are zealously adhered to, but what profit be it to either the regular establishment or the reservist, when a lecturer without equipment which may be studied must appeal to the imagination of the men to visualize the weapon which he is discussing. The lecture is given, quite often perfunctorily, and even then there is some display of interest. But instead of three or four drills devoted to hammering home the subject, the next week's drill period is devoted to some other topic and so ad infinitum. Thus there is no follow up for several weeks in succession and obviously very little likelihood of any appreciable amount of information being absorbed.

Why not lectures and discussions for three or four continuous drill periods by specialists in the subject who know how to develop the topic into one of absorbing interest and see to it that the weapons discussed are available for demonstration and for handling by the men.

It is nothing unusual to have Reserve battalions embark on their 15 days annual active training without a single item of infantry weapon equipment besides their rifles and bayonets and expect efficient performance of combat problems. Surprisingly enough remarkable results are achieved.

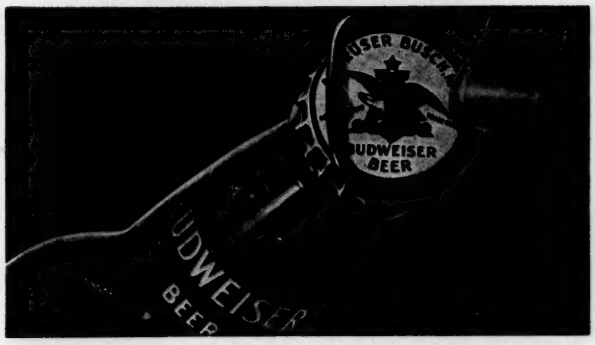
Can not the tables of organization for these Reserve battalions include specialist platoons adequately equipped.

A step toward this objective is being made by the proposal that each battalion include a communications platoon. If so then why not also provide for chemical warfare and howitzer platoons? There is no insurmountable difficulty toward such an objective. And the members of these units with equipment for demonstration will thus be able to teach the reservists something concrete which will prove of actual value in time of emergency.

Constant, wearying repetitious emphasis on drill neither makes for interest nor appeals to the intelligence of the average reservist who reads so much each day in the newspapers of how everchanging warfare is being waged abroad

(*Continued on page 49*)

CROWNS A FLAVOR ALL ITS OWN



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America's New Disaster Fighters

By 2d Lieut. James L. Denig, U.S.M.C.R.

NEW ENGLANDERS have always been latently aware of the exposure of their cities and industries to the possible attack of overseas enemies. In 1898 rumors of the whereabouts of Admiral Cervera's fleet rudely shocked Yankees out of their lethargy. Twenty years later German submarines off Provincetown created near-panic among Cape residents. So now in 1940 New England, no longer shocked or surprised at anything, prepares for the next act, if it should come.

A new organization, the Civic Patrol of America, has blossomed forth in the past year, taking for its motto "Forwarned is forearmed." Its founders plan for it to be the central coordinating agency of all relief groups within a community. Thus it can function with equal facility in both peace and war, through flood, fire, hurricane, explosion, or even air raid. The members will be the A.R.P. workers of New England, adding to their war-time duties the equally important work of saving life and property in time of peace.

The Civil Patrol of America originated about a year ago in Gloucester, Massachusetts. Miss Natalie Hay Hammond, prominent Gloucester resident, conceived the idea while talking with a friend just returned from England. The organization of the civilian defenses of London, although then not yet put to the test of fire, impressed her greatly. Why, she asked, can't our towns and cities in America have this protection, useful in time of peace as in time of war? And forthwith she translated her question into action. She begged and pleaded with officials, spoke to local organizations, solicited cooperation, carried on her fight to have a civil protection force for Gloucester capable of handling any disaster, no matter how large. And she did it. The Civic Patrol was organized, trained, drilled, and brought to such a state of preparedness that when, in September of this year, a hurricane threatened Gloucester, the Patrol was mobilized and ready to swing into action.

From Gloucester the idea spread to Portsmouth, New Hampshire. Mrs. J. B. Longstaff, wife of a naval officer stationed at the Portsmouth Navy Yard, heard of the work being done. She became a convert, immediately gathered together some of the civic leaders of the town, and put over her point. Portsmouth would have a Civic Patrol too!

The hurricane of 1938 is still fresh in the minds of New Englanders, and this together with the realization that Portsmouth is a key unit in our system of national defense, convinced these leaders that Portsmouth should have a Patrol. The Portsmouth Navy Yard, chief submarine construction yard in the nation, is the principal defense work in the area. So important is it, and so exposed, that plans are now being rushed to improve greatly the harbor defenses of the port. In the last twenty years they have fallen into an extreme state of disrepair, but now the three principal forts are humming with activity. Even so, military defense of an important area can not be really successful without the full cooperation of the citizens. Witness London.

This cooperation is being given the military and naval commanders of the area by the citizens of Portsmouth through their own organization, the Civic Patrol. It is set up to give food, clothing, shelter, transportation, medical care, and means of communication and protection in the emergencies of peace and war to the citizens of Portsmouth and nearby towns. In addition it functions closely with the civic government to provide authorized, trained volunteers to meet any added exigencies of war. In providing these services, however, the Patrol cooperates fully with the Red Cross and other already established relief agencies.

The provision of these services and the training of the necessary personnel is handled by thirteen committees, each of which has a specifically outlined task to perform, under the direction of the Executive Staff.

Heading the Staff is young, energetic Richard Chase, who combines this job with that of managing his own stationery store in the heart of Portsmouth. Working with him are the Vice-President, Secretary, Treasurer, Legal Adviser, and Publicity Director.

But this Staff is backed up by another important unit, the Advisory Board which offers advice on the many problems arising from time to time. Admiral J. D. Wainwright, Commandant of the Portsmouth Navy Yard, heads this group, aided by his Captain of the Yard, Red Cross officials, a newspaper publisher, a school superintendent, and a Boy Scout leader.

The actual field work of the whole outfit is done by the thirteen committees entrusted with the various aspects of the problem.

For example, the *Protection Committee,* headed by John Gamble, Commander of the Frank E. Booma Post, No. 6, of the American Legion, has the important task of aiding the local police force in times of emergency. Theirs is the job of guarding against sabotage, of providing reserves for the police and fire departments, and of posting blackout patrols if ever an air raid may seem imminent.

Mrs. J. B. Longstaff, original sponsor of the Patrol in Portsmouth, supervises the work of the *Transportation Committee.* The members of this, all women who drive their own cars, wear the grey uniform of the Red Cross Motor Corps, are trained in vehicle maintenance, are taught the layout of the city and what roads to take if certain ones are blocked, and are put through an intensive first aid course. Forming an ambulance, motor, motorcycle, and truck corps, they provide ambulance service, evacuate civilians, and carry supplies of all kinds to those in need.

The *Engineers,* headed by Joseph H. Cullen, Commander of the Emerson Hovey Post, Veterans of Foreign Wars, are assigned to construct, repair, and keep serviceable such

vital municipal necessities as the water supply system, roads, bridges, power plants, and sewerage system.

Communications are handled by a committee under the direction of a local newsdealer. Its job is to keep track of all committees when they are mobilized and to provide efficient and rapid inter-communication between them and with the outside world. In this work are combined the services of messengers, telephones, and short wave radios, these latter being operated by the many "hams" who have volunteered.

Medical treatment at the emergency field hospital is furnished by a group of doctors belonging to the *Medical Committee.* Nurses who will aid them in their work and also give first aid to the victims at the actual scene of injury come under the direction of the *Nursing Committee.* The chief nurse is the Superintendent of the Portsmouth Hospital.

James E. Barnett, President of the Fleet Reserve Association No. 7, has charge of the committee preparing the *emergency hospital.* This committee, working in conjunction with the Medical and Nursing Committees, requisitions and equips public buildings, hotels and inns as hospitals according to necessity. It sees that the proper equipment, such as cots, stretchers, blankets, tents, and tables are available for instant use.

Soup kitchens and other food distribution points to be set up in the city are within the province of the *Canteen Committee,* headed by Andrew Jarvis, operator of a restaurant on Portsmouth's Congress Square. Location of future distribution points is being worked out. Others are conducting surveys of food stocks and where various items are apt to be found. Cooking utensils, stoves, tents, plates and all other similar necessities are being collected for future use.

To bring in medical supplies if the community should be isolated, to provide still another method of communication, to survey damage done in distressed areas—this is the job of the *Civilian Aviation Relief Committee.* A member of the Portsmouth Airport Commission is working on this angle of the problem of providing complete civic protection.

Each of these committees has, in addition to the Chairman, two sub-chairmen, so that there will be always at least one leader able to carry on. Similarly each has three prearranged assembly points where the members collect at the signal for disaster—nine short blasts on the fire-house whistle. Thus, if one or two of the rendezvous are destroyed there will be another one for use. Central headquarters uses a master map to post the location of the committee headquarters after they have been reported. In this way a complete picture of the relief set-up is constantly available for reference. Nothing is left to chance.

In this task of readying themselves for the M-hour, the committees have accomplished much. For instance, barely three months have passed since the idea took hold in Portsmouth, and yet there are 25 members of the motor corps and 20 nurses ready to do their part. A survey has been made of the water mains of the town where parts and supplies for repairing them can be obtained if they should be broken. Each committee has been asked to submit a "must" list to a finance committee so that plans can be made to raise money to buy the essentials. Studies have

(*Continued on page* 48)

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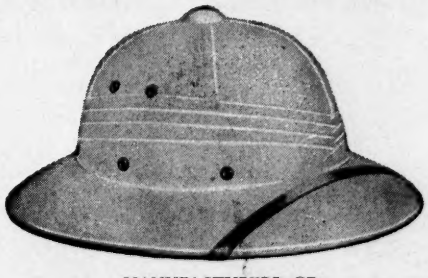

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XUM

THE ARMORER

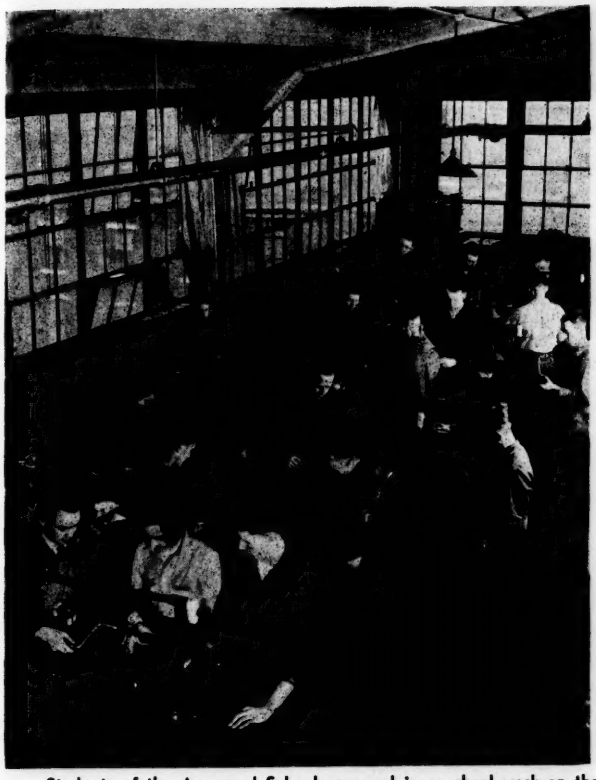
By John G. Walsh, Jr.

First Lieutenant, U. S. Marine Corps

"ARMORER" as defined by Webster's Collegiate Dictionary is 1. "One who makes or repairs armor or arms." 2. "One in charge of arms and armor, as, formerly of a knight." This definition clearly indicates that an armorer was an essential cog in the ever changing art and science of war as far back as the Middle Ages, when metal clad Knights-errant went forth armed with dagger, sword, and lance. In that period the armorer was concerned on the one hand with the shaping of metal for the armor which was to protect the body of the wearer, and on the other hand with the shaping of metal into weapons which were to penetrate this same armor, and disable or dispatch an opponent into the land of the blessed. From these days of almost purely blacksmithian activities, this race between offensive weapons and protective devices has continued up to the present day. There is still some doubt as to whether, at sea, aerial bombs and naval gunfire can penetrate the protective armor of naval ships, and whether, on land, the fire of any gun can penetrate the protective armor of tanks and various armored vehicles.

The armorer as the producer of armor alone passed from view with the end of the Middle Ages, and from that time on confined his activities solely to the fabrication of offensive weapons. The results of the excellent work of these armorers or gunsmiths in the United States as producers of firearms can be read in any history book. One of the outstanding examples is the marksmanship of the Revolutionary frontiersmen who, with their fine Pennsylvania long rifles, many times made the British Army feel the effect of the deadly accuracy of these much-sought-after weapons. The production of almost all weapons gradually passed from the hands of gunsmiths (our first American armorers) to large manufacturing establishments. The small gunsmith still retains his trade, but functions, as per Webster's definition, almost entirely for civilian marksmen. Large manufacturing establishments supply all weapons to the armed services. However, since they are unable to repair these weapons away from the factory, the services are compelled to designate and train enlisted men for this purpose. These men, known as armorers, are charged with making necessary repairs to all weapons in order that maximum battle efficiency may be maintained.

18 Marines and 1 Coast Guardsman who made up the Class of the Armorers' School which was graduated on 28 February, 1941.



Students of the Armorers' School engaged in overhaul work on the M1903 Rifle.

Before proceeding further with the duties of an armorer in the Marine Corps, it might be well to describe the process by which an armorer is trained and prepared to perform his duty with field organizations. An enlisted man desiring training as an armorer submits his applications through his commanding officer for such to The Major General Commandant. He must have the following qualifications: mature age, good record, sergeant or below, equivalent of a high school education, and two years to serve after completion of course on his present enlistment, or an agreement to extend his enlistment for this period. If he meets these, he may be ordered to the Marine Barracks, Navy Yard, Philadelphia, Pennsylvania. While undergoing the five months' course at the Armorer's School, Depot of Supplies, U. S. Marine Corps, 1100 South Broad Street, Philadelphia, Pennsylvania, he will be messed and quartered at the Navy Yard, being transported each day to and from the Depot by bus. Two five months' courses are conducted each year, one commencing on or about March 1st, and the other on or about September 1st.

The Armorer's School is located in the Armory of the Depot of Supplies. This Armory is, at present, the sole repair establishment for all weapons of the Marine Corps, and is the place where ordnance material, which has been surveyed and recommended to be shipped to DQP, is sent for inspection, salvage, repair, or destruction. The instructors in this school are competent enlisted men, each and every one a trained ordnance

(*Continued on page* 46)

SETH KLEIN JOINS MARMON-HERRINGTON AT INDIANAPOLIS

The automotive industry is moving back to Indianapolis. This "greatest inland city," the home of some of the best known names in automobile history, names like Marmon, Stutz, Cole and National, is having a noteworthy rebirth in automotive activity.

One of the names, heard most frequently in connection with automotive developments in Indianapolis is that of Marmon-Herrington. This company, in little more than a decade, has become known all over the world for its achievements in the design and manufacture of "All-Wheel-Drive" and "crawler" type vehicles, widely used in military and exceptionally difficult industrial services.

And now still another name, one of the best known in automotive circles everywhere, Seth Klein, is coming back home to Indianapolis, to become associated with Marmon-Herrington.

Probably no man in America has a wider personal acquaintance among automobile men than Seth Klein. Starting as purchasing agent of the Cole Motor Car Company back in 1912, he has been identified with leaders of the industry ever since that time. Every 500 mile race at The Indianapolis Motor Speedway since the first in 1911, has found Seth Klein on hand in some official capacity, and this will be his 22nd year as starter of the great classic.

Mr. Klein was associated with The Fedders Mfg. Co., radiator manufacturers for 19 years. For the past 8 years he has been sales manager of the Detroit Gear and Machine Division of the Borg-Warner Corporation of Detroit. He returns to Indianapolis as assistant to the vice president of the Marmon-Herrington Company, Mr. Bert Dingley.

Sport fans in every classification will be glad to welcome Seth Klein back to Indianapolis. His interest in professional football and hockey, and in trap-shooting has given him a big acquaintance here. He was at one time, president of the Indiana State Trap Shooters Association, and the Indianapolis Gun Club.

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XUM

Wanted: Eyes for the Troops

By Lieutenant Colonel Prentice S. Geer, U.S.M.C.

IT IS an extremely interesting procedure and at times quite disconcerting, to place one's self in the other man's shoes and see just how or what we look like. The story of Alice in Wonderland when she climbed through the looking glass and suddenly saw things in such a queer and distorted perspective, is something we all may well ponder upon.

To gaze upon a landscape or to view questions from one angle only, will in time cause a person's vision or thoughts to become narrow. Other people looking at you and through your thoughts will have an advantage beyond belief. It is the ability to place one's self in the other's shoes that brings balanced thinking and a clear vision as to what should be done. It also brings a keen appreciation of relative values. This ability to transfer one's thoughts or position to the other side is not easily developed. It is a difficult transition and takes time and study, not to mention fairness and an impartial mind if one is to accomplish this feat.

The military man by the very nature of his duties should be a most impartial, unbiased and fair-minded individual. He should have the ability to place himself in the other man's shoes and see himself as clearly and distinctly as he does the other man. Officers attached to combat units should be particularly interested in how their units look or appear to enemy eyes.

It can be easily understood that a fight between two individuals one of whom is near-sighted and the other whose vision is normal, would be unfair and would end disastrously for the near-sighted individual. The same is true when applied to armies or units engaged in battle. The army or unit which has at its disposal innumerable eyes peering and scanning the moves of its opponent, has the army or unit not so equipped, at a great disadvantage. This is so apparent that no further discussion of the subject is considered necessary.

This peering into and scanning the moves and conduct of the enemy is called observation. The words "peering" and "scanning" are used purposely as they convey a meaning which no other similar words carry. Observation is not merely a look at or a quick reconnaissance of the moves and disposition of the enemy. It is a careful, ceaseless watching by innumerable eyes, observing every little occurrence that takes place and reporting it to higher authority. Let us assume that one of two opposing forces observed but its range of observation did not penetrate very far beyond its own front line because the naked eye was the principal means of observation. The other force by using the instruments made for such purpose, is able to peer into and scan each and every move made by the enemy for two and three miles, particularly dwelling upon those events happening along the immediate front line and the developments. Here again it is believed not necessary to predict what would happen eventually.

Observation is divided into two general classes: (1) observation by air and (2) observation by land. These two classes of observation have separate and distinct missions. Observation by air studies the larger movements long before contact is made, in addition to observation during and after contact. Observation by land by its very nature is limited to a smaller area of vision and activity. It should be devoted to a ceaseless and careful peering into and scanning the minute moves and individual conduct of the enemy along its front lines. Thus observation by land may be divided into the following classes: (1) by patrols, (2) by observation posts, (3) scouts, (4) reports from front line units, (5) prisoners, (6) deserters, (7) inhabitants and documents.

Generally speaking it is believed that the subject of observation in most books on military activities has been treated in altogether a too academic manner. These books constantly and too often, briefly state that "observation of the enemy should be constant." With this statement we all agree but exactly what does it mean? It is a phrase formidable in is meaning but lacking in proper explanation. Many people see but very few have the ability to observe. Thus it is repeated that it is a phrase formidable in its meaning but lacks proper explanation. Is the enemy going to allow himself to be observed? This is ridiculous on the face of it. Are men going to steal through the underbrush for miles until they work their way close enough to the enemy to see or observe what he is doing? Then it follows that they must steal just as quietly and as far, to return to their positions. It would appear that this procedure involves a period of time unknown. Yet how is it to be done? Too, perhaps three hours and more must be consumed in this act and time is precious. Once gone it never returns.

How are contacts going to be made or discovered? Are they going to happen just by accident or will patrols deliberately strike the enemy again and again in order to find out its numbers, activities and dispositions? This procedure if carried out constantly will be costly not only in time but in lives of men. Are the front line units able to determine whether the enemy is striking directly at them or sliding off to the right or left flank? What is the activity of the enemy two or three miles to your front before contact is made by him? Do you send out patrols with instructions to continually strike until the activity of the enemy has been definitely determined? It will take hours to cover the two or three miles, carry out your mission and return. In the meantime the enemy may have moved and struck with superior force immediately upon your heels, leaving you no time in which to convey to higher command the information you have, or even to use it to your own

benefit. It must be clearly understood however that there will be times when patrols to the front will be the only means whereby information of the enemy may be secured. There will be other times when the terrain presents no great barrier and patrols will not be necessary if proper means of observation are used and maintained. Too often that old and precious factor known as "time" enters and defeats our plans. How can time be defeated in the gathering of information. Can it be defeated?

It is believed that time may be defeated in the gathering of information when *every* officer and senior non-commissioned officer attached to troops equips himself with a good pair of field glasses whose power is such as to enable the user to see clearly and distinctly, objects two and three miles away. When this has been accomplished then the "innumerable eyes" spoken of previously have been found and used as intended. Then and only then will there be real observation. It will be practically impossible for the enemy during daylight hours at least, to surprise or deceive the front line troops. Patrols will have eyes able to penetrate thickets and woods far to their front. A flash in the sunlight can be located quickly when miles away and its meaning made clear. Smoke rising can be investigated without traveling miles to the source. Artificial appearing shrubs or clumps of trees may be torn apart from a distance of two or three miles and the purpose defeated. Shores can be scanned and its terrain laid bare before landing takes place. Obstacles may be detected and avoided. These and innumerable other aids to patrols and front line units, are made easy to detect and discover without travelling miles.

The personnel of observation posts will be able to really observe and study small movements in the enemy's territory. The shifting of troops can be followed and reported upon as good glasses are able to penetrate far beyond rifle range. The observation personnel will have eyes at their disposal which will pierce through thicket and wood. Many times patrols will not be necessary for the reason that with the aid of good glasses the observation posts will be able to pick up the desired information. Time unquestionably has been saved and men's lives spared. There will be a good possibility of detecting and discovering ambushes which are being laid two or three miles to your front because the enemy knowing you are still an hour or more away by road or trail, has become careless and exposed himself. With the aid of good glasses enemy observation posts the personnel of which have become careless, also will be detected through the underbrush as they move around. Hours will have been saved rather than expended in fatiguing detours and the pushing of oneself through the underbrush in order to get just a little bit closer.

To those who are interested it is suggested that they go out on a broken terrain with a good pair of 7x35 or 8x30 glasses. Fix a target or better, station troops two or three miles away in woods or broken country. Now locate them with your glasses and see how distinct and clear their actions show up. You can even see them moving behind the trees and underbrush. Now lower your glasses and observe them with the naked eye and see if anything but woods and distance come within your vision. After you are satisfied that you can see nothing, let the troops advance normally as they would prior to an attack, until the naked eye is able to pick them up and they come within rifle range. Calculate now the time involved and the distance covered by the troops before you were able to range and you will then understand what observation with good glasses can do in the saving of time and distance.

Now to return to Alice in Wonderland. If by chance we do not have our officers and senior non-commissioned officers so equipped and the enemy does, what must we look like to them, being unaware of their presence while they with their glasses, can at leisure study what we are doing and perfect plans to defeat us?

This is real observation of which one rarely reads of in books but it is of vital importance to us if we are to succeed. For a long time and even to the present time, it has been believed that the artillery officer is the only individual really necessary to carry and use good field glasses. No greater fallacy ever existed. *Every* officer and senior non-commissioned officer should have his own pair of field glasses which are his own personal property and which he should guard and take care of jealously as they are of infinite value to him. If we do not have these glasses with us then we are like the near-sighted individual pitted against another who can really see and observe. It is submitted that the field glass is as much a part of the equipment of an officer and senior non-commissioned officer as is the pistol and steel helmet, and furthermore, if we are not to be hampered and handicapped in the field which means defeats and heavy losses it behooves every officer and senior non-commissioned officer to acquire a good pair of field glasses.

There are certain types of glasses more adapted to military use than others. The 7x35 or 8x30 is recommended for good all around use. The 7x35 has certain advantages which should be studied and suited to one's needs. Glasses of greater power are not necessary as they are difficult to steady and hard on the eyes. It is realized that good glasses are expensive. However, arrangements may be made through the various Post Exchanges to purchase these glasses at reduced price and over a period of time through the firms handling them.

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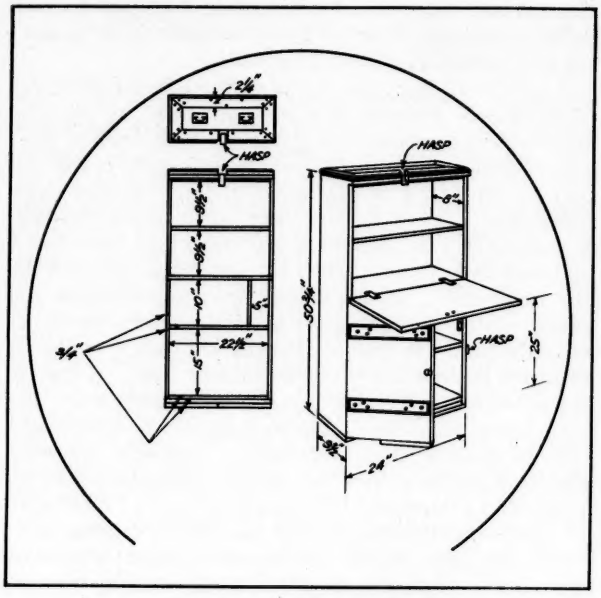
Combination Book Box and Desk

By 1st Lieut. L. B. Robertshaw, U.S.M.C.

THE lack of a desk has long been a problem of the junior officer at most posts. This combination book box and desk may be the solution to that problem. (See Figures 1 and 2.)

The design is simple, being only a slight modification of the "Inman Publication and Field Equipment Box" (Marine Corps Gazette, March, 1939). The lid is made in two parts. The top half is hinged on the middle shelf of the box and opens down to form the desk top. The lower half hinges on the side and opens out to provide support for the top half or desk top. This lower half fits comfortably between the knees when one is seated at the desk. The lower section is large enough (see Figure 3) to accommodate a small folding stool if desired; but chairs are usually available in the barracks and boxes are plentiful in the field. Inside measurements have been determined by the size of the books and equipment required for all officers up to and including the rank of colonel as itemized in paragraphs 1-3 and 5-42, Marine Corps Manual.

This box, which can be made at an expense which meets the J.O. pocket-book, may be the solution to this common problem. Its dual use of book box and desk all-in-one adds a luxury to a necessity. It was inspired by the "Inman Publication and Field Equipment Box" which appeared in The Marine Corps Gazette, March 1939, and my own problem of being without a desk to call my own.



Combination Book Box and Desk.

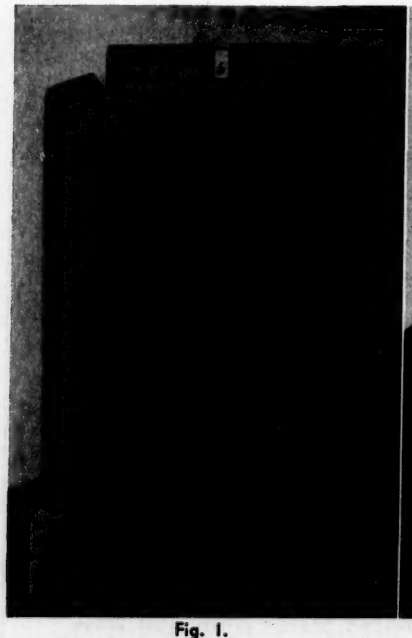


Fig. 1.
Combination Book Box and Desk, front view.

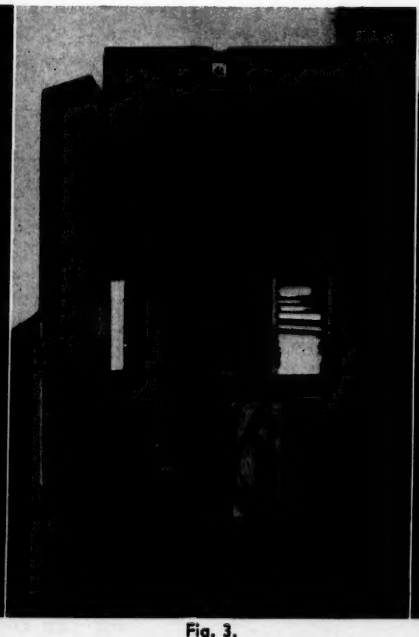


Fig. 3.
Combination Book Box and Desk, showing lower shelf arrangement.

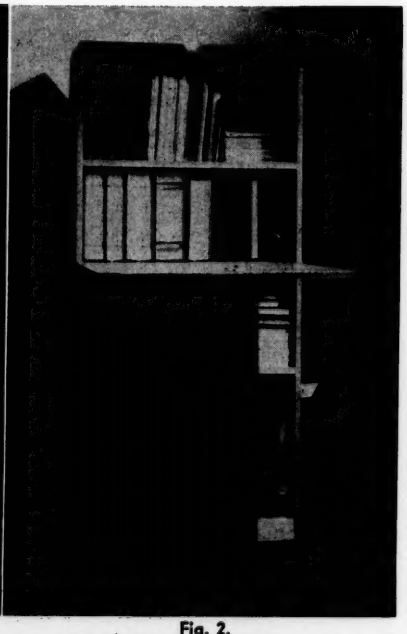


Fig. 2.
Combination Book Box and Desk, set up as a Desk ready to use.

MARINE CORPS MUSEUM

The Marine Corps Museum has received a collection of World War and other trophies from the Depot of Supplies at Philadelphia. A number of these articles were received without sufficient record for their proper use in a museum. Anyone having information about such trophies which were turned in to the Depot of Supplies, will please communicate with the Curator of the Marine Corps Museum at the Marine Barracks, Quantico, Virginia, who will furnish an inventory of the articles in question. Information is particularly desired as to where each article was originally found, used or captured, by whom or by what outfit, with what engagement it was associated, date of same, by whom it was turned in to the Depot, and any other information about each article.

2 155mm brass cartridge cases about 4 feet long.

2 German anti-tank Mauser rifles with bipods Nos. 8409 and 8037.

1 German rifle fitted for telescopic sight, No. 3100 (Danzig 1917).

1 German rifle No. 2043 (Amberg 1918).

1 Hungarian rifle No. 1035-A (Budapest M-95).

1 German carbine No. 3100 (Erfurt 1918).

1 Chauchat automatic rifle with clip, No. 150450.

1 Vickers machine gun with tripod, cartridge box and belts.

1 Light Maxim machine gun with bipod, No. 1561, with which was packed a green and yellow plate marked "Light Maxim."

1 Spandau heavy machine gun, water cooled, camouflage painted, No. 7751.

1 Spandau air cooled machine gun, No. 6769, with which connections for airplane instruments were packed.

1 Light German machine gun, water cooled with bipod —camouflaged.

1 Spandau water cooled machine gun, No. 5229.

1 Maxim heavy machine gun with mount, No. 42249 (Berlin 1918).

1 Heavy water cooled Schwarzlose machine gun with tripod, No. 38950.

1 anti-aircraft machine gun mount with tripod.

1 Lawrence machine gun mount with tripod.

1 Granatenwefer (German pineapple grenade thrower), No. 2243.

1 Granatenwefer in original case with tools, No. 1969.

2 Black patent leather German officer dress helmets with mitre board tops and large brass eagle ornaments.

1 Box of miscellaneous articles of German equipment —rawhide bags, a canteen, ammunition boxes, "Gott Mit Uns" belt plates, shoulder insignias, hat ornaments, etc.

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Book Review

RIFLE MARKSMANSHIP. By William L. Stephens, Jr., First Lieutenant, Ordnance Dept., U. S. Army. Published by A. S. Barnes & Company.

As the author states in his introduction, this book is intended primarily "to help members of college and school rifle teams and the boy or girl who desires to learn to shoot." It meets all the requirements for that particular purpose. The author has carefully avoided dogmatic statements and the tyro should obtain considerable information which will be valuable in the early stages of rifle marksmanship training.

The first seven chapters, which comprise about one-third of the book, contain general information regarding the shooting equipment which a small bore competitor should have. The second third of the book, chapters 8, 9, and 10, describe the positions, sighting, aiming, and trigger squeeze phases of rifle marksmanship. These are presented especially for the benefit of small bore shooters who will compete under the rules of the National Rifle Association. The last three chapters are devoted to care and cleaning of the rifle and to range procedure, again from the viewpoint of the small bore shooter.

The book is well written and presented in such a form that it is easily understandable by a beginner. The subject matter deals entirely with the small bore (caliber .22) rifle. In some instances the author's remarks are at variance with instructions contained in our regular training manuals and usually the details are not so clearly presented nor so complete as in the Basic Field Manual. The book is recommended for youths who desire to compete in small bore matches either in local clubs or in bigger competitions.

M. A. EDSON.

MARINE TRANSPORTS

The following ships of the Navy have been designated as Marine transports and have been authorized allowances for Marine Detachments:

U.S.S. *Heywood*, U.S.S. *George F. Elliott*, U.S.S. *Fuller*, U.S.S. *Wm. P. Biddle*, U.S.S. *Neville*, U.S.S. *Harry Lee*.

XUM

CARDED

The M1 Rifle

By Melvin M. Johnson, Jr., (Captain, U.S.M.C.R.)

THE latest-type Garand M1 rifle is to be issued to the Marine Corps to replace the Springfield M1903. Due to quite unavoidable circumstances there has apparently existed a so-called "controversy" over the Garand and Johnson semi-automatic rifles. Nevertheless, during the past several years I have publicly urged the maximum possible production of the M1 rifle, as well as other arms, because of my apprehension over the serious shortage of up-to-date types of weapons in this country.

I do not wish, therefore, to be put in the position of having obstructed any part of the arms program. I am deeply concerned over the international situation, and believe that this country must make the greatest effort humanly possible to become fully armed, as well as to supply arms to those dependent upon us, and to remain armed.

I am therefore taking the liberty of making a statement about the Garand M1 semi-automatic rifle as modified in 1940, and adopted by the Marine Corps.

The new M1 rifle is the standard arm of the U. S. Army, adopted in January, 1936. It represents over a dozen years of research and development.

As of January, 1941, it is the only military rifle of any type actually being produced on a daily production schedule in the United States. The Springfield M1903 is no longer being produced, and the supply of spare parts is exhausted. The situation is critical, to say the least.

Based upon my own personal observation and experience I believe the new model of 1940 Garand M1 is an accurate weapon. I believe it is superior to any bolt-action arm because the M1 can deliver as many hits as the hand-operated piece but in much less time. Modern combat requires this increased fire efficiency.

I have personally fired a new-type Garand at 600 yards on the "B" target, and on one occasion loaded and fired 26 rounds in one minute, scoring sixteen bulleyes, ten "fours," two "threes," or a 90 per cent score at a rate of practically one shot every two seconds.

I have seen expert riflemen obtain high scores with the new M1, and have witnessed "possibles" at 600 yards. Personally I prefer the Garand-type peep sight close to the eye and the wide Garand front sight post for normal rapid shooting.

Armed with the M1 semi-automatic Marines will be able to shoot faster, requiring less time and less exposure to hostile fire to obtain their normal high quota of hits. Recruits will not need to practice bolt manipulation, hence more time can be devoted to holding, aiming, squeezing, and service of the piece.

To the many officers and men of the Marine Corps, as well as of the Army, Navy, Coast Guard and civilian authorities, who have helped and encouraged my organization and myself, I wish to express my profound gratitude. They may be interested to know that the Johnson rifle, as well as the Johnson light machine gun, both in caliber .30 U. S., are now being put into mass production to fill recent orders from abroad which have had the approval of the State, War and Navy Departments. Every effort is being made at our factories to commence early deliveries. These facilities are and of course will be also available for other production related to our national defense or the defense of other countries in which our Government has a vital interest.

The present situation is more serious than at any time in our history. Prolonged discussions over incidental "gun-crank" features must now give way to the basic problem which is to obtain enough serviceable rifles in the shortest possible time, and learn to shoot them to the best of our ability.

It has been my privilege as a reserve officer in the Corps to be called a Marine. Henceforth, as a Marine on active duty I, too, shall have a new rifle, the M1 Garand. More than this I cannot say.

JIM DEADERICK

Perhaps you know Jim Deaderick, who has been a "Caterpillar" man for more than 11 years. Having held executive positions in both the sales and service departments, he has earned countless friends in the field. If you do know him, you'll be doubly interested in this important promotion.

James H. Deaderick, who has been assistant sales manager of the western sales division of Caterpillar Tractor Co. since 1939, has been appointed the company's assistant general parts manager.

Mr. Deaderick, whose headquarters have been at "Caterpillar's" San Leandro, California, offices, has been transferred to Peoria. In his new capacity, under the general managership of L. G. Morgan, Mr. Deaderick will have active charge of all general administrative activities in the Parts Department, as well as supervision of all Parts Depots. W. W. Gordon has been appointed Parts Manager in charge of physical inventory and its control; and A. H. Yingst, Parts Manager in charge of orders, invoicing, distributor contact, etc.

Born in Santa Barbara, California, Mr. Deaderick attended grade and high schools there. He studied at the engineering school of the University of California until 1925, when he left college to engage in the contracting business.

In 1929, he entered the employ of Caterpillar Tractor Co. as a member of the service department at San Leandro. A year later, he was sent to the Peoria Service department. In September, 1933, he became assistant service manager, and returned to San Leandro in the following year as western service manager. He held this position until his appointment as assistant sales manager of the western division.

WHO SUNK THE HAMPSHIRE?

Twenty Five Years Ago the Armored Cruiser Mysteriously Disappeared

By Horace S. Mazet, U.S.M.C.R. (A.O.)

An official communication from the Lords of the Admiralty under date of June 7, 1916, staggered the allied nations. It read: "The Commander-in-Chief of the Grand Fleet reports with deepest regret that the cruiser *Hampshire*, bearing Lord Kitchener and his staff to Russia, was sunk last night by a mine or possibly a torpedo, west of the Orkney Islands. The sea was very rough and despite every effort at a speedy rescue there remains, it is feared, little hope of any survivors."

The unbelievable consternation wrought by this news is still vividly recalled. In the cities people stormed hotels and offices, snatching papers from the hands of newsvendors. Indescribable was the painful effect of the news in the clubs, coming as it did upon the heels of shocking reports on the battle of Jutland.

All flags were half-masted. Curtains at Army offices were drawn. Papers regarded Kitchener's death as a national catastrophe, hardly able to comprehend fully the blow which had struck at the Allied cause. How had this awful thing come to pass?

In the face of widespread disbelief, some were convinced that it was all a hoax; others believed that a spy and murder plot were responsible. For years to come people who were known to be former German agents or spies claimed to full responsibility for this paralyzing coup. I have talked with some of them, and read the claims of others. Naturally such an achievement would be manna to the soul of an egomaniac.

Just how the ship on which Kitchener embarked was sunk, by a mine, and how he met his death is at last revealed in a strange story smuggled out of Germany by a former rigid-suit deep sea diver who knows more about the *Hampshire* than he cares to tell. He swears the tale is authentic. In certain respects it checks, and disposes of conflicting claims, yet at other points it is open to question. But there is no denying its interest for those who would tear away the veil of uncertainty and doubt which has shrouded the disappearance of the armored cruiser ever since 1916.

During the years intervening, rumors, reports and confessions have appeared in many papers, articles and books. Perennially some apocryphal figure arises with the claim that he and he alone was the spy who sent the great militarist to his doom. Mention has been made again and again of agents who presumably boarded the *Hampshire* and blew her up or betrayed her to a lurking U-boat.

Perhaps the most persistent of all these spy yarns is that featuring the Afrikander, Fritz Duquesne, intense patriot and agent extraordinary. In the month of May, 1922, the New York City Police Department arrested a character who called himself Captain Craven, but who actually was Duquesne, accused by various departments with responsibility for the loss of the *Hampshire*. Indeed, the British government issued a warrant for his extradition, charging him with murder on the high seas.

Duquesne is as remarkable as his reputed exploits. Refusing to serve with the British, he was listed by them as a deserter, disappearing in 1916 and generally thought dead by his fellow officers and friends. But he had only gone to South America where he was shortly responsible — so he told me — for the sinking of 27 Allied vessels and lesser accomplishments in the service of the Central Powers. Duquesne, to whom alone Sir Herbert T. Fitch, former detective-inspector of the Special Branch, Scotland Yard, gives the palm as the only character he ever heard of who can rightfully claim the title of Master Spy, was sighted three times by detectives during the war. Each time he vanished.

He told me that he successfully dynamited the *S.S. Salvador*, blown to bits in the middle of the South Atlantic. He also destroyed the *S.S. Vauban*. He fired the Bahia coaling station. He blew up *HMS Pembrokeshire* and four merchant vessels which left South America never to reach port. But, he protests, these were merely milestones in his efforts to win complete freedom for his native South African Republic. Despite his record as a unique international figure, Duquesne is a man of mild appearance and quiet mein. He insisted to me that what he had done was no more than any patriot would have done in his stead.

"And how do you think I felt," he asked bitterly, "When I saw myself described as 'The Man Who Killed Kitchener' in Wood's book by that name? Me, a murderer!"

Scotland Yard, in the years of the war, had plenty of reason to believe Duquesne was not dead although they could not lay a hand on him. Fantastic as it seems to anyone with knowledge of the awful seas in which *HMS Hampshire* sank, Fritz Duquesne told me he had made shore safely on a raft after the explosion aboard

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the armored cruiser — a claim at variance with the facts published in a book on the tragedy by Phillips, one of the few survivors.

Duquesne further told me he had landed secretly on American soil in the summer of 1916, having crossed from abroad on the German undersea-boat *Deutschland* to Baltimore. At any rate, the police did locate him some years later in New York where he was masquerading under the name of Trafford Craven. When arrested, he confessed that he was the long-sought Capt. Duquesne. Application was promptly made for his return to England, and British authorities furnished the New York Police Department with the following charges:

> That Fritz Duquesne went over to the Germans as a spy during the war; that he managed the murder of a Russian officer attached to Kitchener's staff and with stolen papers smuggled himself aboard the *Hampshire;* that once there he signalled German submarines after advising German naval units of the probable course of the battle cruiser. That after the sinking he was picked up by a U-boat.*

At least, so says Fritz Duquesne. Clement Wood, in his book "The Man Who Killed Kitchener" makes out a case for Duquesne, who is the culprit in question. But Duquesne cannot escape the fact that very few knew the hour of the *Hampshire's* departure, and far fewer knew Kitchener was aboard her.

The secret of Lord Kitchener's mission was strictly guarded at the Admiralty, according to the official narrative of the tragedy, and only five or six persons who were actually concerned with the arrangements knew of the programme in any detail.

The entire matter was equally carefully preserved by the navy. Only on board the destroyer which brought him from the mainland and the Flagship where he spent the afternoon of June 5th, was Lord Kitchener's presence at the Fleet Base known. Excepting the Flag Officers of the fleet, who met him at luncheon in the Flagship, the officers and the crews of the fleet at Scapa Flow who saw the *Hampshire* leave the anchorage knew nothing of her mission. It is confirmed by survivors from the ship that the fact that the vessel was to proceed to Archangel became known to the crew only during the day of her departure, and that Kitchener's presence on board was a complete surprise.

This mass of evidence that almost no one knew that the armored cruiser would make the trip is further bolstered by official recapitulation of the party's progress after leaving King's Cross Station. Lord Kitchener had expressed a wish a week earlier to go on the *Hampshire* to Thurso and to proceed in her to Scapa Flow, but the Commander-in-Chief on being consulted did not consider it advisable, owing to the risk of submarine attack, and telegraphed on June 4th that it would be safer for the crossing to be made in a destroyer. On reaching Thurso, therefore, Lord Kitchener and his mission embarked in the *Oak*, while the servants and luggage were accommodated in the fleet messenger *Alouette*. The party lunched on board the Commander-in-Chief's Flagship *HMS Iron Duke* at Scapa Flow, and left her about 4 p.m. for the *Hampshire*.

The uncertainty about the choice of vessel thus fairly completely disposes of the claims of the German spy Carl Ernst† that he planted bombs aboard the cruiser by means of suborned seamen in the crew who were sympathetic toward the Central Powers.

As to the claim that signals from the *Hampshire* to a lurking sub were responsible for the sinking West of the Orkneys, a most interesting and vital circumstance proves this to be a rank invention. Secret orders to Archangel had been given to the captain of the *Hampshire* by the Commander-in-Chief on the previous day (June 4th). These orders directed her to proceed by a route to the *east* of the Orkneys, and to maintain a speed of 18 knots until reaching the latitude of 62°0′ N., after which a speed of at least 16 knots was to be maintained, and, weather permitting, two destroyers were to screen her as far as that latitude — also significant.

Lack of complete advices as to a clear path through the easterly mine fields was a fatal element in the web of fortune. So severe a gale had been blowing that the mine-sweepers could not accurately clear their sector. For good reasons, therefore, the *Hampshire* commander decided to proceed along the western coast. In accordance with her revised orders, the ship slipped from her buoy at 4.45 p.m., picked up off Tor Ness shortly before 5.45 p.m. the destroyers *Unity* and *Victor,* which had been ordered to accompany her as escort, and proceeded on the selected route. She ordered a speed of 18 knots to be maintained. By late afternoon, however, the gale had shifted from Northeast to North, and was rapidly increasing in violence.

Soon after 6 o'clock *Victor* signalled to *Unity* that she could make only 15 knots. Then *Unity* signalled her inability to maintain a speed of more than 12 knots. Consequently at 6.20 p.m. *Hampshire* signalled to the destroyers to return to their base, a totally unforeseen event. The commanding officer no doubt felt satisfied that the storm then raging practically precluded the possibility of successful submarine attack, which was at that date the more probable danger to be apprehended.

West of the Orkneys the ship, her speed reduced by the gale to 13½ knots, plowed her way toward Archangel. Water-tight doors on deck were ordered secured as gray-green seas pounded over her decks in never-ending succession.

At 7.30 a tremendous explosion occurred in the fore part of the ship. She immediately lost steerageway in the storm and broached to. The electric power failed; lights went out; no wireless communication was possible. A little later another explosion occurred, according to some eye-witnesses and she commenced to go down by the bows.

The commander ordered all hands on deck, and in an effort to save Kitchener, despatched an officer to prepare the Captain's barge, located near the bridge. At this moment Lord Kitchener appeared on the slanting deck, accompanied by his naval aide. The commander cried out to Kitchener to come to the fore part of the bridge in order to reach the barge. Kitchener hesitated, the commander cried out again to take to the boat, but the War Lord stood still and looked about. He was evidently unable to grasp the enormity of the catastrophe which had struck from the sea.

The cruiser bore a pronounced list to starboard. The crew made unavailing attempts to launch their inadequate boats. They were smashed to kindling before their agonized gaze. Men were dumped into the swirling, icy

*According to Duquesne, the U-22, Commander Hoppe.
†In his book "One Against England" (Dutton).

waters and others were swept from the rail by the surging seas.

Four officers sought to aid Kitchener on the quarterdeck, but the Earl of Khartoum never stirred from the spot and continued to look upon the tragic scene with complete calm. Finally his aide grasped his arm and shouted to the men about him: "Make way for Lord Kitchener!"

Disaster was already upon the stricken cruiser. The *Hampshire* sank suddenly and breathlessly. Only a handful of the crew was saved. If Duquesne got safely away on a raft, as he told me, he must have almost immediately disappeared, for there is no record of his having landed ashore.

The sinking was witnessed from shore. The observer rushed to the telegraph. Destroyers were first to reach the spot at 10 p.m. and, with other ships arriving later, spent the night searching in every direction and taking bodies from the water. But by this time, of course, rescue was futile.

On June 10th, at 4:55 p.m., the Secretary of the Admiralty announced in part: "It has now been established that the *Hampshire* struck a mine at about 8 p.m. on Monday last."

But how this strange accident occurred, aided by the inflexible finger of Fate, is at last revealed in an account written by a German soldier who served at the time in the cypher code room of the Central Radio Station at Neuminster. And this account dramatically tears away the veil of secrecy which has shrouded this momentous question for more than twenty years.

It was just before the Battle of Jutland (his report states). We knew, of course, that the German High Seas Fleet was planning action on a large scale. Our work demanded that we know military plans in advance. At the same time there was increased activity on the part of the English, indicating that they also planned action of some sort at approximately the same time. Never before had such a flock of messages been intercepted, and each one had to be decoded in short order.

We were well prepared to do this. Each day the English changed their code keys, but it was always possible for us to discover the key after exacting work. How it is done of course I cannot tell.

I recall vividly the beginnings of the episode which was to mean so much to the High Command. It was at night. Several of us sat in our office, the lamps turned low, bent over our desks. It was quiet in our building at the Neuminster Station. Our superiors had, shortly before, thrown a whole bundle of intercepted cypher messages in for us to digest. We had divided these telegrams equally and set to work. And it so happened that it fell to my lot to translate a message which engrossed me from the first glance. Its locale lay far from the source of the other messages—the first word I decoded was "Orkney Islands."

Finally I had before me the message of an English destroyer, reporting officially to the Admiralty that a search in the North-South direction West of the Orkney Islands had established a seaway clear of mines. The captain of the ship evidently considered this information of sufficient importance to repeat his message three times within the hour, to insure its safe reception by the Admiralty.

It was quite evident that an important operation was forecast near the Orkneys. Subsequent repetitions of the same message confirmed my suspicions of its vital importance.

A path free of mines! But what did the English plan up there in the northernmost part of their country, in the forlorn Orkneys? What was up? A free path. . . . That was it! The only logical conclusion was that there, west of the islands, an important shipment of munitions was being routed.

At the completion of my decoding I apprised the authorities of my discovery and related the news to the navy department. Every detail of those days I can still recall clearly. An overwhelming interest in the information disclosed by three identical and mysterious messages whetted my curiosity like a gunner waiting for the results of his shots to be phoned back from the spotter.

The first consequence of my discovery was orders to Captain-Lieutenant Kurt Beitzen, then commander of mine-laying submarine U-75. Beitzen was ordered out by Vice Admiral Reinhard Scheer, Commander-in-Chief of the Imperial High Sea Fleet at Wilhelmshaven, to proceed post haste to the Orkneys and to sow mines in the very path indicated as being free.

U-75 reached the West side of the Orkneys on May 27, coming from the North, in the early morning. At 6 a.m. the submarine was at the precise spot mentioned in orders. By 9 that morning it had sown 34 mines, and had departed on a northerly course around the islands to Wilhelmshaven. On the first of June it passed the general scene of the Jutland affair and it reached the submarine base in Heligoland Bight safely on the third.

On the evening of June 2nd, an intercepted radio despatch I was decoding sent a shock down my spine. This particular sheet I received among a pile of others concerning details of the Jutland Battle, all naturally of extraordinary interest and import. But this one message, disarmingly terse, was sent from the operator on board a small coast defense vessel, broadcasting an SOS. The boat had run on a mine West of the Orkneys and was in a sinking condition.

Naturally in those hectic days of the Skagerrak fight of the mightiest fleets ever assembled, our entire resources, our whole intelligence and every thought were so concentrated on the activity unrolled in this greatest of all sea battles that little time was left for the mining of one small coastal vessel. At the moment I had my hands full with battle reports.

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But later, when relieved, as I sat at home still steeped in the tense atmosphere of the decoding office, with nerves frayed from the recent tour of duty so that I could not sleep, I weighed the meaning of this isolated message. Surely the enemy had not despatched a destroyer to find if the path were clear for one insignificant coast defense vessel! Not at such a crucial time in naval history. Evidently, then, the shipment of munitions or the convoy was still to go!

Now the English knew the path was not clear. Now they knew we had planted new mines right under their noses, and would change their plans accordingly. So our game was up in sector; instead of a giant we had caught a pygmy, and nothing more.

Imagine, then, my astonishment when I learned that on June 6th the *Hampshire*, a 11,000 ton armored cruiser, was sunk with her entire complement of 650 men, and had taken to his grave England's most important military figure, Kitchener!

* * * *

That is the story of how the *Hampshire* met her end. The renowned lawyer, Arthur Garfield Hays, who successfully defended Fritz Duquesne against extradition to England, told me that the man is evidently an authentic secret agent of undoubted amazing exploits, but that his connections with the tragedy of the *Hampshire* are rather doubtful. Master spy he may have been, but he will have to produce more proof before I acknowledge his claims relating to Kitchener's steel coffin.

In forwarding his report of the official inquiry, the Commander-in-Chief of the Grand Fleet said: "I cannot adequately express the sorrow felt by me personally, and by the officers and men of the Grand Fleet generally, at the fact that so distinguished a soldier and so great a man should have lost his life while under the care of the Fleet."

I prefer to think that even Duquesne shares in that feeling.

THOMAS C. GILPIN

United Services Life Insurance Company takes pleasure in announcing the appointment of Thomas C. Gilpin as manager of its Hawaiian Department, Honolulu, Territory of Hawaii. Mr. Gilpin will assume his duties February 5, 1941.

Mr. T. C. Gilpin has been associated with United Services Life Insurance Company as manager of the Metropolitan New York District

United Services Life Insurance Company has insurance amounting to $12,788,414 in force as of December 31, 1940. This record has been established in 22 months. The Company is owned and operated by and for Commissioner and Warrant Officers of the Armed Forces of the United States and members of their families.

The Company has been licensed to do business in the Territory of Hawaii since August 30, 1939.

THE ARMORER

(*Continued from page 37*)

repairman. All have served with field units sufficient time to realize the problems which will confront an armorer in the field, and as a result are better able to instruct the students, not only for duty in the Depot Armory but also for duty elsewhere.

There has been some argument as to whether it is better to educate and train a man by textbook, by practical work alone, or by a balanced combination of the two. It is my belief that this course, a combination of practical work and textbook instruction under the supervision of a competent instructor, will produce under the circumstances the best possible armorers. Each student is furnished a complete set of the textbooks pertaining to the weapons listed in the next paragraph. As each weapon is studied, textbook references are covered fully, and with this is combined the instructor's daily lectures on how repair and overhaul work is best accomplished. After this classroom work comes the practical overhaul work in which each student is required to overhaul several unserviceable weapons in each particular classification and put them in a condition of serviceability that will satisfy rigid Armory requirements. Then a written examination is given. The mark in this examination and the mark on the practical overhaul work are combined to give the final mark for that weapon. At the end of the course, the marks in each of the seventeen subjects covered are averaged to give the final mark for the course. Any man who does not show aptitude for work as an armorer is, after fair warning, disenrolled from the course.

To further explain the above discussion, the seventeen subjects covered by the school are listed below, showing the time spent on each subject in mechanical training and inspection and overhaul.

COURSE OF INSTRUCTION

	Mechanical Training	*Inspection and Overhaul*	*Total*
1. Rifle, U. S., caliber .30, M1903	17½	427	444½
2. Pistol, Colt Automatic, caliber .45, M1911	17½	35	52½
3. Rifle, Browning Automatic, caliber .30, M1918	17½	28	45½
4. Gun, Browning Machine, caliber .30, M1917	35	35	70
5. Gun, Browning Machine, caliber .50, all types	14	....	14
6. Gun, U. S. Machine, caliber .22, M1	14	....	14
7. Pistol, Colt Automatic, caliber .22, ACE	17½	....	17½
8. Pistol, Colt Automatic, caliber .22, WOODSMAN	17½	....	17½
9. Gun, Thompson Submachine, caliber .45, M1928	17½	....	17½
10. Gun, 37mm, M1916	21	....	21
11. Mortar, 3" Trench	14	....	14
12. Mortar, 81mm, M1	21	....	21
13. Rifle, U. S., caliber .22, M1 and M2	14	14	28
14. Shotgun, riot	14	....	14
15. Rifle, U. S., caliber .30, M1	35	....	35
16. Requisitions, Spare Parts, Etc.	7	....	7
17. Small Arms Ammunition	35	....	35
Total	329	539	868

It is to be noted from the above that much more time than usual is spent on rifle overhaul work. The time allotted to this work should be less, but during the present emergency it is necessary to supply sufficient rifles to equip the large number of recruits being inducted into the service. As a by note it might be mentioned that in the calendar year of 1940, 20,005 rifles were completely modified, overhauled, inspected, and packed by the Armory. This is in addition to the repair work on other weapons that goes forward at all times. However, this extra time spent on rifle overhaul work is by no means wasted in the training of an armorer. Just as a thorough course in rifle marksmanship will give a Marine the essential groundwork for marksmanship training in other weapons, so overhaul work on the rifle will give the prospective armorer such training in the use of tools and his hands that overhaul work on all others weapons will come easily.

From the hours assigned it can be seen that emphasis is being placed on the Rifle, U. S. caliber .30, M1903; Pistol, Colt automatic, caliber .45, M1911; Rifle, Browning automatic, caliber .30, M1918; Gun, Browning machine caliber .30, M1917 and M1917A1; and Rifle, U. S., caliber .22, M1 and M2. Since these weapons are the principal ones with which armorers must deal, thorough instruction in them makes for better serviceing in the field. The other weapons listed are ones which are used by special units. While not emphasized to the extent that the others are, sufficient instruction is given that minor repairs can be accomplished in the field. The subject of small arms ammunition is covered to the extent that an armorer knows what goes to make up the ammunition, and how to care for, handle, and store it. Item 16 is inserted to cover any instruction which should be given and is not covered under the other individual items. Under this general classification is included instruction in the usual replacement quantity per 100 weapons for three month periods in order that the armorer will have an idea of just how much of a stock of spare parts he should maintain in order to provide for the proper serviceing of weapons.

The duties of an armorer may be classified under one phrase: "To keep the guns firing." This rather short phrase would seem to set forth a relatively easy task, but this is distinctly not the case. Anyone who has spent time on a Marine Corps rifle range can testify that it is not an uncommon sight to see the light in the Armory burning at night, and again just after breakfast before the details are mustered, on mornings when advantage is to be taken of the no wind period not long after daybreak. Sights have to be changed, trigger pulls are not just right, feed systems are faulty, or other familiar repair work is necessary. The hours required of an armorer are long, not only on a range but with field units as well. During the daylight hours the guns are in operation, and therefore necessary repairs and adjustments must be made after the day's work is finished so that the guns will be ready for the next day's firing.

Up to this point I have confined myself almost entirely to armorers who might well be classified as small arms repairmen. Prior to the formation of the present Defense Battalions, the expansion of existing artillery units, and the addition of the various weapons to aircraft units, the armorer thus far described was the person who actually deserved the title and was to be found performing his duty almost solely at the various rifle ranges. However, with the rapid expansion of the Corps and the ever-increasing complexity of the weapons with which it is armed, this term now includes many others. Artillery mechanics, who are trained at the Army Ordnance School, instrument repairmen trained at the same place, specialists trained in the school maintained by the Sperry Gyroscope Company, and aviation ordnancemen trained by aviation units, are all really armorers in the sense that their services contribute to the phrase, "to keep the guns firing." However, whatever be their particular specialty, the course of training necessary for each of the above roughly corresponds to that of the small arms armorer.

All of the above listed personnel in the U. S. Army are grouped into Ordnance Maintenance Companies which are attached to Army Corps in sufficient strength to provide one company for the third echelon of maintenance of the weapons of each Division of the Corps. Each of these companies is supplied with specially constructed bus-bodied vehicles, each for a particular phase of maintenance. For example, there are small arms repair trucks, emergency repair trucks, automotive repair trucks, welding trucks, artillery repair trucks, machine shop trucks, and spare parts trucks.

While the Marine Corps is not of sufficient strength to require Ordnance Maintenance Companies of such size as are found in the Army, it is clearly evident that some provision for such units should be made. Undoubtedly the inclusion of an Ordnance Platoon in the new Marine Division is for just such a reason. Such a unit will be made up of specialists, each trained to perform his particular function. However, since the rifle is still the

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primary arm of the Marine Corps, each member of this ordnance maintenance unit should be a qualified small arms armorer. This precludes the chance that any of the basic weapons of a unit will lack proper attention when all small arms armorers are absent and only a searchlight and sound locator specialist is present. In the case of the armorer, as in all other crafts, specialization is worthwhile, but fundamentals must not be neglected. It's the old story of not letting the trees hide the forest!

The function of the armorer has tremendous importance, whether he works with small arms, fire control instruments, artillery or aviation ordnance. His is not an easy task. It requires patience as well as skill. Perhaps, by thoroughly understanding his problems, you can help him to achieve greater efficiency, thereby increasing the efficiency of the entire unit to which he is attached. The Marine Corps prides itself on its tradition. How much older is the tradition of the armorer. Deservant of high respect is "the one in charge of arms and armor."

AMERICA'S NEW DISASTER FIGHTERS

(Continued from page 35)

been made so that relief work can be sidetracked to secondary roads in time of war in order to leave the main thoroughfares open to the military. No cluttered roads, such as were lately characteristic of France and Belgium, are wanted in Portsmouth. A census of houses in the country to which children could be evacuated is being conducted. School officials and members of the Parent-Teacher Associations are cooperating in a tally of the child population of the area. With this knowledge authorities will be able to plan efficiently for any emergency. A count is being made of basements and cellars available and suitable for use as refugees or aid raid shelters. Plans are being discussed for an unannounced monthly drill in order to keep everyone on his toes.

Naturally such results as these and the many more sure to follow as the organization nears completion, could not be hoped for if the entire community did not cooperate. Portsmouth has pitched into the job with an inspiring surge of civic pride. The need for the Patrol has been recognized, and now the plain folk are coming forward to do their part.

The frequent general meetings, held in the central fire station, are open to the public. Anyone can come, speak his piece, make his suggestions, volunteer his services. And this is just what has happened. Everyone is made to feel that he has a personal interest in the Patrol. Democracy in action.

A look at the leaders emphasizes the universal appeal of this movement. There are a stationer, a Navy wife, a lawyer, a Red Cross official, a newspaperman, a garage owner, a Salvation Army Captain, a newsdealer, a doctor, a teacher, and a restaurant owner—a few of the many occupations represented in the Patrol. Men from all walks of life have willingly plunged themselves into the work.

Not only have individuals come forward, but so have civic organizations and business groups. For instance, there are The American Legion, the Veterans of Foreign Wars, Fleet Reservists, Boy Scouts, Girl Scouts, Sea Scouts, Salvation Army, Red Cross, Chamber of Commerce. The Boston and Maine Railroad, noting the significance of Portsmouth's efforts, has offered trucks and large buses to the Patrol to aid in their work when the time comes. Many local businesses, such as ice and coal companies, have done the same. The public utilities of the community—gas, electric, and telephone—have instructed their repair crews, under their respective foremen, to cooperate with the Patrol, especially with the Engineers. The local newspaper, the *Portsmouth Herald,* has helped by publicizing the idea throughout its circulation territory. Station WHEB in Portsmouth has donated a fifteen-minute period every Tuesday afternoon so that the Patrol can tell of its work and spread its message throughout Northern New England. Pamphlets telling of the activities of the Patrol are circulated throughout the town. Louis de Rochemont, director of "The Ramparts We Watch" and himself a citizen of Portsmouth, dispatched a camera crew to record a recent drill. These pictures of the Patrol at work will be incorporated into a future edition of the *March of Time.*

The military and naval services have watched with great interest the activities of the Civic Patrol. The Coast Guard has instructed its representatives in the vicinity to cooperate with the organization. The Army commander of the harbor defenses and the Navy officials at the Navy Yard have been interested too, especially in the matter of blackouts. Throughout the city Legionaires will be posted, if need be, to warn householders to extinguish lights and also to protect property from vandals and looters during the blackout period.

Many local businesses have agreed to conduct registration for the Patrol. Those wishing to join pay a fee of ten cents which goes to pay for the distinctive Civic Patrol pin and the information folder. The registrant gives his name, address, committee he wishes to work for, and occupation. It is planned to consolidate this information and that from other Civic Patrols into a master file available to all relief agencies in neighboring communities. Thus, if urgent help is needed by a town overwhelmed by a disaster, authorities need only to refer to the file, then request reinforcements from some other nearby Civic Patrol.

Probably the most remarkable thing about the whole movement is that it has cost the Patrol itself but a trifling amount—that for the pins and literature. All the time put in by the committees has been given freely, all the armbands used for identification have been bought by the individuals themselves, all the gas used in the trucks and automobiles has been paid for by the owners. Of course, in time money will have to be raised somehow to defray certain necessary expenses. Some items of essential equipment, like the two portable radio sets planned or the many stretchers needed by first aid workers, must be bought by the Patrol. But fundamentally the movement has advanced all this distance toward complete organization with the expenditure of but a trifling amount. What better cooperation could be offered by the members of a community?

On Navy Day last the Patrol held its first drill, forerunner of many more to come. What took place? At 12:30 the disaster signal sounded. Nine short blasts on the fire house whistle—a short interval—then nine more. Instantly the various units went into action. The drill was built around the supposed bombing and destruction of a good

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portion of Kittery, a small town across the Piscataqua River from Portsmouth. The huge lift bridge across the river at this point was supposed to have been destroyed also. On the Kittery side "refugees" were assembled at a wharf, where small boats picked them up for the trip across to Portsmouth. Into each boat together with a nurse and a first aid kit were put children, bandaged and tagged. At least 75 were ferried over in half an hour.

In the meantime the other committees were erecting a large tent hospital on the playground in Portsmouth, organizing a soup kitchen, preparing basements for the reception of "refugees." All these tasks were completed within an hour and a half of the signal.

In Kittery the women's motor corps had collected the "injured," applied first aid, and hurried them to the wharf. When the boats reached the other side, the "refugees" were picked up by the motor corps and rushed to the various centers. Two actual cases of severe injury were handled by the corps in quick order.

Later in the afternoon the Navy Day parade provided the Child Welfare Committee with a good test of its facilities. Those who wished to leave their children with the Committee while they watched the parade were invited to do so. The children were tagged and taken care of until their parents arrived to claim them, all without a hitch.

In the evening a test blackout was staged, with the Legionaires on duty throughout the city. Observers were much impressed with the success of the blackout inasmuch as all were asked, not compelled, to cooperate. And so ended Portsmouth's first Civic Patrol drill, a distinct success in spite of the minor difficulties which can easily be ironed out.

The advantages of this kind of an organization are many. Probably the greatest is the protection the Civic Patrol affords when a large-scale disaster engulfs a locality. Whether it be fire, flood, explosion, hurricane, or air raid, it is reassuring to know that one's home will have all the protection possible. Too often large-scale disasters overwhelm existing relief agencies, unable to cope with the magnitude of the hour. The Civic Patrol's coordination of all existing relief organizations, and the creation of several new elements, eliminates a good deal of the waste and inefficiency inherent in the usual system. It should be able to deal with anything that may happen in the future.

Another distinct advantage is the elimination of dependence on the military and naval forces of the nation. The national guard has been called into Federal service. There may come a day when the Coast Guard, Army, Navy, and Marine Corps are too busy elsewhere to go to the aid of a stricken community. In this case God surely helps those who help themselves.

A more intangible, but no less important, effect that the Civic Patrol will have is psychological. People will feel a new spirit of community pride. Their morale will be lifted, especially in war-time, if they can feel that they too, in the home front, are helping in the national effort. Socio-economic lines are apt to be weakened considerably if not entirely submerged. Every man in the Civic Patrol can feel that his part in the huge team play is as important as that of any other. Rich man and poor man are going to be thrown together. They will work together and a new understanding will undoubtedly arise. An examination of the effects of similar work in England will reveal that just this sort of psychological effect has taken place. And England will undoubtedly be the better for it.

One other advantage. Even if it does nothing more than this, it will have served its purpose. It should awaken the people of America to the dangers which the nation faces. The world is changing rapidly, and Americans should be enough on the alert to observe what is happening. And learn by the lesson.

Will the idea of the Civic Patrol spread? Of course, the founders hope and believe that it will. Two small towns near Portsmouth—Newcastle and Rye—have come into the scheme under the leadership of the larger city. Kittery, site of the Navy Yard, has signified her intention of forming a Civic Patrol of her own. Medford, Lowell, and Boston, all in Massachusetts, have started the formation of Patrols. Across the continent one is found springing up in Beverly Hills, California. Down Mississippi way there is another. A movement to make the formation of Patrols compulsory in every town and city in Massachusetts has been reported. With such a start the Civic Patrol of America should keep on growing. If a community is looking for a way to do its part, and at the same time provide a well-organized relief agency, Civic Patrollers believe this is the way to do it.

As Jessie Logie, former Field Director of the American Red Cross, recently said, "This is one of the greatest forward steps towards civilian training and relief in time of emergency. It will definitely eliminate the horrors attendant on European evacuation when panic-crazed people themselves blocked the only roads to their aid. I believe it should be copied with local modifications throughout the country."

A CRITIQUE OF RESERVE TRAINING

(*Continued from page 33*)

and then wonders why he never learns how to apply these developments.

No one is directly blamable for the present training deficiencies. There has been lack of equipment and lack of personnel, but through specialization and intelligent training the Reserve should be able to exemplify the oft repeated but little heeded maxim of the Chevalier Follard that: "War is a trade for the ignorant, but a science for the expert."

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AS IT WAS BEFORE

(*Continued from page 28*)

followed by a brief period of advanced training at Quantico, especially for service in France. Training in open warfare was emphasized. In addition to the general training, there were special schools in various branches at the recruit depots and at Quantico. In addition to the 69 officers, the Marine Corps school for machine-gun instruction at Utica, N. Y., graduated 2,084 enlisted men.

The units composing the Fourth Brigade of Marines were trained in France as part of the Second Division, A.E.F. The Marine replacements hurried into the fighting, received little or no training in training areas in France.

Marine Corps Aviation

On April 6, 1917, the Marine section of naval aviation consisted of four commissioned officers, one warrant officer, and 30 enlisted men. On November 11, 1918, the strength was 250 commissioned officers, 32 warrant officers and 2,180 enlisted. Training was conducted at a station for Marine flyers at the Navy Yard, Philadelphia, and at Navy and Army aviation establishments. In March, 1918, the Marine flying field at Miami, Fla., was established, and became the main training center for Marine aviation. Officer candidates were given a course in ground work at the Massachusetts Institute of Technology, followed by training in actual flying at Miami. Upon qualifying, they were commissioned in the Reserve Flying Corps. Mechanics were trained at the Marine section of the naval school for mechanics at Great Lakes Training Station and at a similar school in aviation mechanics at San Diego, Calif.

On November 11, 1918, the Marine aviation forces in France comprised 165 officers and 895 enlisted men, operating 177 land planes, and in the Azores 12 officers and 135 enlisted men, operating 18 seaplanes and flying boats.

HILTON HEAD AND PORT ROYAL, 1861

(*Continued from page 27*)

be attributed to the Navy. Later instances of vandalism (such as the party of soldiers who fired their pistols through "a fine piano on Parris (sic) Island") were severely checked both by Dupont and General Sherman. One Beaufort account of Dupont's initial occupation has it that the naval forces were greatly offended because civilians had fled before them.

Successful occupation of Port Royal Sound made Hilton Head as valuable to the Union Navy as it had been to the Confederacy. The forts were repaired and garrisoned, and the large entrenched camp about a mile inshore of Fort Walker was expanded and improved to provide quarters for over a corps of Union troops. A naval station, at or near Seabrook Landing, seems to have utilized Hilton Head's only railroad, although existing photographs and sketches fail to reveal any lurking locomotives. Block-long sheds housed not only provisions for the armies operating inland, but stores of cable, spare anchors, and a veritable ship-chandlery for the vessels whose assiduity offshore was to work the rebellion such harm. As Union operations continued and the sounds were gradually brought under control, Hilton Head waxed in importance, located as it was, athwart the Skull Creek-Beaufort River inland waterway between Charleston and Savannah. Numerous expeditions against such points as Pocataligo, Cosawhatchie, Ashepoo, and the Charleston and Western Railroad (now the Atlantic Coast Line), orginated on Hilton Head. Beaufort was not continuously occupied, although Fort Royal Ferry, across Whale Branch (now the bridge crossing on U. S. Highway 21), was always either garrisoned or under close observation, to prevent a surprise descent upon Port Royal. Even Gardens Corners, now known for surpassing dinners and gardenias, found a place in the reports. When in 1865, General William T. Sherman's great army was sweeping through the Carolinas, its right wing (the XVII Corps) moved via Beaufort, and Sherman stopped at Hilton Head to transact administrative matters. Perhaps this was the Island's last and greatest day, for with the return of peace, its military significance diminished. True, a small defensive work was maintained near the site of Fort Walker until after the Spanish-American War, as was Fort Fremont, across from Parris Island on St. Helena's. But the slumbrous Naval Station, Port Royal (later to become the Marine Barracks, Parris Island), was no more to be compared with the station of Civil War times than were the remote little Army posts to Fort Walker and its entrenched camp for 12,000.

At the last, the naval service has returned to Hilton Head. The Marine Corps artillery at Camp McDougal occupies a former Lighthouse Service site. The changes of seventy years (assisted by the great hurricane of 1893) have returned the island almost to virgin growth. But one great plantation survives—now the hunting-preserve of a northern financier. The negroes have changed little, though no longer run away at sight of Marines, as at first (there died this year on Hilton Head an aged negress who recalled the mass execution of several escaped slaves for offenses against the Civil War military jurisdiction—it had become an island legend thereafter). Ruins of the plantation-houses, cemeteries which contain eighteenth-century marble mausoleums, and masses of earthworks and masonry in the Fort Walker site, remain as the historical deposits of Hilton Head.

They who have never been there can scarcely catch its flavor: a mixture of virgin territory and underlying dim history. "Hilton Head?" you sometimes answer—"The most remote place on earth, but full of history if you want to dig it out."

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(2) Battles and Leaders of the Civil War, Volume 2.

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(4) Photographic History of the Civil War (Volume, "The Navy"), published by P. F. Collier & Sons.

AN ANALYSIS OF THE CROSSING OF THE MEUSE RIVER

(*Continued from page 23*)

continued their reconnaissance of the river in the zone of the 5th Corps and started plans for bridging operations.

On the 8th, orders were received for the 2d Division to effect a crossing at MOUZON and LATANNE.

The Germans had destroyed all bridges in this area except one just south of MOUZON and just north of LATANNE. The former was under machine gun and artillery fire and the latter had been partially wrecked.

The Division plan contemplated a crossing at two points on the night of 9-10 November by the 4th Brigade, with all artillery supporting the crossing, but the project had to be abandoned when the Engineers failed to have the bridges ready, and it was not until the night of 10-11 November that the plans were crystallized and then only in part.

The 6th Marines were in position at the appointed hour having moved up under cover of darkness from the BOIS DE LIMON on the 9th, but the Germans had discovered the attempt and forced the Engineers to abandon work on the bridge. There was nothing for the Regiment to do but return to the partial security of the woods. The movement was called off for that night and plans immediately set on foot to accomplish the crossing the following night.

The night of 10-11 November witnessed a more determined effort and though the 6th Marines were again foiled in their attempt, the 5th Marines fared a little better down stream where two bridges were successfully thrown across. One of these was blown out by a direct artillery shell, but the other one held and in one hour the 1st Battalion was across. By 11:30 P.M. the 2d Battalion got across and by the following daybreak the 89th Division was across.

Briefly, that is what transpired and while it is useless to be harshly critical and unfair regarding these events and decisions made during the heat of battle, we must, in order to avoid like mistakes, study them with a critical mind in the quietness of our study.

European battlegrounds furnish us with a fertile field for a study of river crossings and from Napoleon's time forward, history is replete with fine examples. True in those days there was no aircraft to detect a contemplated crossing and bridge material could be moved up during daylight to the points selected with little chance of discovery by the enemy.

French tactics, then as always relied upon secrecy and deception with great attention to details and long and careful planning. If there was a possibility of the enemy detecting the movement, then plans were laid for crossings at numerous points and at the final moment, patrols were thrown across the river to determine the weak spots and it was at these points that they pushed their main effort.

For the crossing of the LIMMAT in 1799 by Massena, a total of three weeks was consumed in preparations and the gathering of materiel and boats. It required 1,000 men to carry 37 boats from their hiding place to the bank of the river on the night selected for the crossing, the wagons with the bridge equipment having been kept under cover until the final moment when they were pushed rapidly to the river. Troops began to cross at 4:45 A.M. and by 7:30 A.M., 8,000 men were on the other side of the river.

The crossing of the Rhine by Blucher in 1813 was only successful because the point chosen was undefended, for their preparations were incomplete and lacking in many details. Likewise, the crossing at BERESINA in 1812 by Napoleon when pursued by the Russians would have resulted in a rout and annihilation had not the wary Napoleon despatched a large force of unarmed stragglers toward the logical point of crossing while he himself took another route with the remnants of his army.

History is also replete with glaring examples of a total disregard for present day intelligence tactics. In other words, Commanders of great repute decided what the enemy was going to do rather than what the enemy was capable of doing. This very point is exemplified in the crossing of the YALU by the Japanese in 1904. In spite of ominous warnings, nothing could shake the faith of the Russians that the crossing would take place at a certain point, and their dispositions were made accordingly. When the actual crossing took place at another point it was then too late to make other dispositions, and the crossing was completely successful.

There are several outstanding requirements in crossing a stream and in general each depends upon the others.

Technical skill is important and in some cases may even govern. This, however, would be in the case where the crossing was entirely unopposed or very lightly defended and where speed is essential in getting the troops across. Boldness and a consummate skill in erecting the bridge are therefore requisites under these circumstances. Under practically all other conditions the factors of secrecy and surprise are essential, with a moderate amount of luck on the attacker's side. These factors would avail little however if the technical skill were lacking and you could not "beat the enemy to the draw."

Now let us summarize for a moment and then determine how the crossing of the MEUSE on the night of 10-11 November compares with those few examples which I have cited, together with numerous others of which I have read in the preparation of this paper.

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To make an apple pie, it is first necessary to get some apples, and so, it is necessary that we collect the materiel and lay most careful plans, both from the technical and tactical point of view.

Having accumulated the necessary materiel, it must be gotten to the point of crossing and kept from the prying eyes of enemy aviators. This done, we must see that the element of surprise is not lacking for without it we sacrifice much of our chance of success. Still further, we must arrange for adequate artillery support and lastly, there must be a coordinating head for the operation, that is, someone on the spot.

As Colonel Robinson has told you, there was no bridge train present with the 4th Brigade at this time. Three or four bridges had been constructed on land preparatory to launching in previous operations, but these had been left in places miles from the rivers and the Division found itself confronted with a crossing and nothing to accomplish it with. This, in spite of the fact that everyone in the American Expeditionary Force knew full well that the Germans would destroy the bridges behind them and that if a final defeat was to be administered to the Germans, bridges were a vital necessity.

The roads in rear of the MOUZON-LATANNE zone were for the most part second class and rendered almost impassable by recent rains and continuous traffic. The 2d Engineers were kept constantly busy keeping them in repair.

Orders providing for the actual construction of the bridges were not issued until the 8th of November. It was only possible to detail two companies of the 2d Engineers for this duty and it was necessary to assign two companies of the 9th Infantry to assist in the work. In previous operations the French equipment had proved useless and it was necessary for the Engineers to improvise bridges.

It is true that heavy bridge material was delivered at YONCQ, but it could not be gotten into usable shape in time for the crossing. It was therefore necessary for the Engineers to wreck old German barracks in BEAUMONT and LATANNE and from this source they managed to contrive a set of footbridges unlike any theretofore used.

On the night of 9-10 November when the first crossing was ordained, the Germans discovered the attempt and forthwith stopped it, and *the element of surprise was forfeited.*

The crossing was postponed until the following night and the 6th Marines, back in the BOIS DE LIMON, awaited the signal to start for the bridge site. They were due there at 9:30 and at this time the artillery which was to fire a preparation would just be raising their fire to objectives further in rear. Just at dusk when the Marines were about to leave the woods and with some four miles to march, they saw their artillery firing on the opposite bank of the river. Only shortly after this they witnessed the fire lift to targets in rear. There was just a slight mistake of about one hour in the barrage and had their bridging operations been successful they would have perforce made crossing without artillery support. Thus we see that another of the essential elements to a successful crossing was lost. As events transpired, it is fortunate that they failed to execute a crossing in this area.

Four hundred yards to the south, the so-called LATANNE crossing met with greater success, and while the element of surprise was lacking, yet the artillery covering this point did not fail, that is, the firing on schedule.

It did not subdue the hostile machine gunners, nor did it have any appreciable effect on the amount or accuracy of the German artillery fire. It must be remembered, however, that the Germans were falling back on their line of supply and ammunition was plentiful. Certainly it was far more economical to expend than leave it for the Allies to capture.

One other point that may be overlooked is the fact that the German artillery had orders not to retire from their positions until their supported infantry had actually passed through them.

In all fairness to the artillery supporting the 2d Division in this operation, it was the first time they had all operated together as a team and it was a fast moving situation for the advance of the 2d Division had covered some thirteen miles in eight days.

In short, the Americans were deprived of the element of surprise; for the most part their artillery support was inadequate and finally, the makeshift bridges left much to be desired yet in spite of these sad deficiencies the elan of the Division drove forward to ultimate success.

A REVIEW OF CAMOUFLAGE LITERATURE

(*Continued from page* 21)

Under the domain of camouflage the pamphlet states: "Camouflage is applied to all exterior manifestations of the activities of the armies as well as to the rear echelons in its movements. installations and communications." The principal means of camouflage are distinguished as "natural means and artificial means." "The natural means generally utilized are branches (boughs), brushes, (grasses), reeds, furze or other plants found analogous to the area" (where used), "as well as employment on the march of woods or forests, night marches, the use of ditches along the route, march and camouflage discipline and the use of road and other masks to control the view of the enemy." The artificial means "generally employ special materials such as:

— raffia, grasses or leaves with analogous properties
— cloth
— nets garnished with cloth
— nets of cocoa
— painting, etc.

used in conjunction with and as a complement of the natural materials."

Conditions affecting the efficiency of camouflage are:

"A plan of camouflage is absolutely necessary in any campaign."

"Bad camouflage is worse than no camouflage at all."

"In the matter of camouflage; discipline plays the capital role."

"Without discipline the best camouflage is ineffective."

"In combat areas the most minute precautions must be observed, the occupants as well as visitors must maintain strict (camouflage) discipline, notably concerning traffic circulation, finally the chiefs of all grades must by example and observation maintain this."

On the organization of the camouflage service the following is quoted:

"1. Personnel.

The work of camouflage is divided into two categories:

a. The concurrent work, executed generally with natural means.

b. The special work executed by the utilization of artificial means." * * * *

"2. Material.

There exist two classes of material.

a. The material consisting of the equipment of certain corps or troops (gun nets, etc.)

b. The remainder of camouflage material."

"The supply of camouflage material of all sorts is assured by the Engineer Service which constitute the depots and necessary supplies."

The chapters on the general conceptions of camouflage necessary for the execution of the work of camouflage cover the subject a little more elaborately than our own training regulations and manuals but very similar to that of the interpretation of aerial photographs covering shadows, forms, colors and how they appear to the observer under varying conditions, the reproduction of forms and colors by the use of photography.

"Common considerations for all camouflage are the form, the aspect (view), the shadow and relief, the regularity and the color and relative tone values," and concludes "Camouflage is like a double edged sword, well used it renders grand service; poorly used it is very dangerous to the user."

In describing the properties of camouflage material, grasses, reeds, branches, sowing of pastures or fields and the planting of grain over freshly excavated earth are covered under natural means, while raffia wire nets with cloth and with cloth garlands, wire and cocoa nets with raffia and grasses and cloth, are fully described under artificial materials as well as engine smokes, dummy silhouettes, shell holes, nets, screens and illusions created by screens.

Under processes of installing the work.

"Period of movement."

"Camouflage of movements by natural means."

"The orders relative to march discipline, use of ditches along the route, woods, etc., are all mentioned in the provisional instruction on campaign service (in course of revision) and are very detailed and are the regulations of the Armies."

"Their importance should be strictly observed by the chiefs of all grades."

"Camouflage of vehicles by natural means."

"The zones of shadows, the shade of trees, talus, etc., constitute an efficient protection against aerial observation."

"Camouflage of movement by artificial means."

Blending of observation points with the terrain and camouflage of points of passage of rivers and temporary installations is explained by diagrams in several cases, and states that "the camouflage is effected by the occupants using branches, grasses, sheafs of straw, etc., to minimize the observation of the enemy."

Under the "period of stabilization" for which purpose the pamphlet seems mainly to have been prepared "Camouflage of movement by natural means" is covered under "orders relative to the use of routes and trails" and is about the same as our orders on the circulation of traffic under similar conditions. However, several good illustrations show how movement on roads, railroads, trails, etc., may be efficiently screened by the use of natural means such as branches and other natural materials. The details used in the camouflage of batteries, telephone lines, hangars and aviation fields, depots, camps, and cantonments of the French services at the time of the revision of the Manual, are outlined in a fair manner.

Under the heading materials furnished by the Engineer Service, illustrations and descriptions of such fixed defense materials as snipers' helmets and posts, protected observation posts and lookout shelters, dummy shaft observation posts, tower observation posts, fire directory ladders, fire directory telescopic observation posts and periscopes are given in full detail, which leads the reviewer to believe that the pamphlet was prepared to cover only such situations as occurred in World War I (trench warfare) and it does not show much advance in French camouflage since that time, especially in the war of movement.

Their method of instruction is the same as that used all over the world.

1. Theoretical instruction.
2. Practical work.
3. Exercises of application.

However, it pays particular attention to the study of aerial photographs of camouflaged areas and camouflaged organizations. The exercises of application of the principles of camouflage are carried out on their maneuvers and is subject to the closest scrutiny both from terrestrial and aerial observation with the usual attention to detail.

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WAR COLOR FOR ARTILLERY HARBOR BOATS. By Brigadier General Charles J. Bailey, U. S. Army. Published by the Journal of The United States Artillery, Vol. 40, No. 3. November-December, 1913, Whole No. 124, under the supervision of The School Board of the Coast Artillery School, Fort Monroe, Va., Coast Artillery School Press.

A discussion and description of tests of different paintings of certain harbor boats in the Puget Sound area in 1913.

"Four boats were available for night drills:

The Mine Planter *Ringgold;* 145 feet, black hull, white upper works, yellow masts and stack.

The Harbor Boat *Mifflin;* 132 feet, white hull and upper works, yellow stack and masts.

The Harbor Boat *Springer;* 60-foot launch, white hull and upper works.

The Harbor Boat *Thomas;* 105 feet, war color on hull, upper works, stack, and mast."

The writer states "there has never been a night drill, * * * * when it has not been *practically as easy* to pick up the *Thomas* as any of the other boats." Using three forts, Worden, Casey, and Flagler as bases for 60 in. and 36 in. searchlights, "the *Thomas* never passed through the barrier and has frequently been picked up and identified at a distance of 10,500-11,000 yards" * * * * "One night she was discovered in the beam, over 10,000 yards away and another time at 17,000 yards from Flagler, when in the beams from Worden and Casey, 8,000 yards nearer the boat." "All this in war color."

"These facts were told recently to a well informed Naval officer and he stated in reply that the visibility of the war color at night was well known in the Navy, and that it had been selcted for its invisibility by day rather than night."

"For night work alone black is believed the best color."

CAMOUFLAGE AND NATURE IN WAR. By E. H. Thompson, Captain Royal Engineers. *The Royal Engineers' Journal,* Vol. LIII, March, 1939. London, England. pages 124-125.

This article discusses "Camouflage in nature and war" in the *Royal Engineers' Journal* of December, 1938, previously reviewed in these columns. The author, Captain Thompson, is surprised to find that no reference was made to the stereoscopic effect or the effect of relief in "Camouflage in nature and war." Thompson states that the examples of natural camouflage given by Dr. Cott are only fully successful against the one eyed. In this Thompson is correct as a one-eyed person has no stereoscopic vision. Thompson points out that the light and diagonal markings on some of the examples given by Cott only accentuate the shapes of the animal given as the example.

The author compares an airplane observer to a one-eyed man when the observer is observing from an altitude of over 200 yards. In this he is only partially correct as the stereoscopic vision depends entirely upon the observer. In some cases science has proven that individuals have depth perception or stereoscopic vision up to 600 yards. He has forgotten the speed of the plane and the observer's fleeting glimpse when 200 yards over the ground.

However, the author's contention that the airplane camera is not so limited, is entirely correct.

He points out that in some cases where disruptive painting is of value against the "single eye" it can actually be of great assistance to detection when the stereoscope is used. "The stereoscope will dicover the real shape of a solid object and the disruptive camouflage may even help to do so." "It is of little help to pretend to change the shape by paint."

"To deceive the stereoscope the object must be either buried underground or provided with a covering which can be fashioned to represent the natural relief of the ground. Both methods may be too elaborate in practice and the best way to succeed might possibly be bluff rather than camouflage."

"It is notorious that a man needs much experience before he can interpret even common objects on a single photograph. With the aid of the stereoscope, even the beginner has no difficulty in correctly recognizing, by their shape in three dimensions, objects which on one picture appear as unrecognizable blemishes."

"It follows that it should be a never to be forgotten rule that, firstly, when photography is carried out for the detection of camouflage, the pictures should be taken so that any part of the area is covered by a pair of photographs and the pairs should be examined in a stereoscope and preferably in one with a magnification of about 5X."

THE CONCEALMENT OF VEHICLES. Condensed from *The Royal Army Service Quarterly.* The Military Service Publishing Company, 100 Telegraph Building, Harrisburg, Pa.

"Camouflage may be defined as the artificial means employed to deceive the enemy's visual or photographic observation from the ground or from the air."

"It is the object of this article to discuss such artificial aids in their application to the concealment of vehicles, and also to draw attention to certain experiments in this field which have recently been carried out by the Royal Army Service Corps." * * * *

"During the 1936 Training Season it was, however, stressed in Army Training Memoranda that serious thought must be given to the general question of 'camouflage.'" * * * *

"As camouflage is but an artificial aid complementary to concealment, it follows therefore, that the choice of parking places for vehicles must, whenever practicable, be influenced primarily by the possibilities offered for concealment, in conjunction with the camouflage material available." * * * *

The article points out that mechanical transport possesses two articles which lend themselves to camouflage of the vehicles, i.e. "The tarpaulin cover and the ground sheet of the man." * * * *

"To be effective for military purposes, artificial aids to concealment must satisfy the following requirements:

(1) Be available in large numbers.
(2) Be capable of camouflaging both men, materiel, and vehicles.
(3) Be light, easily portable, and convenient to handle.
(4) Be simple in operation.
(5) Be easily prepared, reconditioned, or replaced."

* * * *

* * "Camouflage, to be completely effective, must also be proof against the aerial camera."

The 1936 Training Season was carried on with this end in view.

The following methods were employed:

"Motor Transport Vehicles."

"Netting of 1½ in. mesh waterproofed and garnished with 'raffia' was used on top of a special framework which was fitted to the sides and ends of the load carrying vehicles." Two types were used: "one for load carrying vehicles and one for mobile workship plants" weighing about 50 pounds.

Exposure to weather caused little damage, after long exposure.

"Men."

"Netting of a fish-net type dressed with 'raffia' cut into short lengths and knotted in alternate ways was superimposed on the helmet and overalls of a man, in such a way that it did not interfere with his buttons and badges."

"Light Automatics."

"The screen employed proved most effective in concealing light automatics and overcame the trouble that used to be experienced in the use of grasses and branches due to fading, and difficulty of removal and re-erection at short notice. The screen employed consisted of large mesh netting decorated with 'raffia' shaped to suit the machine gun spider. Adjustment of this net is facilitated by a small centrally positioned leather tie, and the perimeter of the net is marked by an almost imperceptible fringe. This net has alternate effects on either side."

"Tracks and Unfinished earthworks."

"Large mesh netting suitably garnished with 'raffia' of appropriate shade, and rolled on poles to facilitate unrolling and furling has proved most effective in operation." * * * *

* * * * "It is now suggested that a small camouflage unit under Divisional control might be of immense value in the forward area to assist the units in obtaining adequate concealment."

BURLAP AND FISH NET. By Captain S. Y. McGiffert, Field Artillery, *The Field Artillery Journal*, Vol. XXVI, No. 5. September-October, 1936, pages 335-341 inclusive. Published by the U. S. Field Artillery Association, 1624 H Street, N. W., Washington, D. C.

Captain McGiffert stresses the need of practicing the principles of camouflage in peace in order that these principles will be applied automatically in war.

Quoting from this excellent article:

"A battery seen is a battery lost!"

"For twenty years the Field Artillery's positions have been disclosed from the air, rather than from terrestrial observation."

"Concealment from the air, next to observation, and technical characteristics of fire delivery, must consequently prod the mind of the Battery Commander when selecting a position—or even approaching the position. The greatest factor in the camouflage of a position is in the suitable position." ***

"We hope to train our batteries with what we know they will need in battle." ***

"I am often reminded of two training principles of the Reichswehr 'The soldier can only do in war what he learns in peace' and 'Do not teach a soldier anything he must forget the first day he is subjected to battle conditions.' Among the most important war training subjects —which can be applied in peace—is camouflage."

"In 1918 our Army, having passed through a period of extensive preparation for combat, finally went into battle."

" 'A German aerial observer stated that the Americans do not seem to have yet learned the importance of taking cover, that they had plainly seen without the aid of field glasses, American batteries firing in the open with no attempt at camouflage, or hiding in natural cover. Kitchen fires were disclosed by smoke in the immediate vicinity, and every kind of material was scattered around. Ammunition was plainly visible by being piled up high and arranged in rectangular shapes. Vast camps consisting of pup tents were visible all over the country and amazingly near the front lines. These were invariably open at one end and showed the interior shadow as black triangular spots.' "

" 'It was also stated that they supposed that such matters were due to inexperience, but they were astonished that the high command should have profited so little from the experience of other belligerents, and should have appeared to be so indifferent in sacrificing life, valuable materiel, and disclosure of strategic movements by allowing this state of affairs to continue. It was noticed that troops constantly ran out from cover to observe enemy planes.' "

" 'Trucks and big guns were covered with brush but were allowed to stand in plain view on roads. This was of course useless if they moved in day time, as they will always show to the naked eye on a white road as a dark spot, and still more on the aerial photo.' "

" 'A German artillery officer stated that he noticed our

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guns were frequently placed in a straight line and equally spaced; this method leads to easy discovery and gives a splendid target.' "

" 'He also said that some of our positions which were admirably hidden by elaborate system of camouflage were given away by lack of discipline, showing new paths, smoke and general activity around them.'—This in 1918, from a report made by Major Evarts Tracy to the Chief of Engineers."

Evidently the Americans went in to fight and not to hide themselves, but lacking in camouflage training they were soon to learn it in order to be able to fight when called upon.

The Americans quickly "caught on" and became veterans in the applications of the rules of camouflage.

Quoting from an article by Lieutenant Colonel Aymar Embury, Engineer Reserve Corps, Captain McGiffert states the rules of Camouflage.

" 'The rules are very simple:

Do not space the guns equally.

Pick broken ground for the battery position.

Pick a position which can be reached without leaving trails either by men going to the guns or by ammunition supply.

Pick positions which are not subject to enemy fire for other reasons.

Keep spoil covered.

Get rid of blast marks.

Do not erect camouflage which will cast shadows, thereby revealing the fact that there is something important enough to be hidden.' " ***

"Until we caumouflage all firing positions or fire from all camouflage positions and learn to live in them, in wind and rain, haul ammunition, showing no lights by night or tracks by day, only then may we be justified in selecting the word *probable* rather than the word *improbable* when referring to our practice in tomorrow's warfare."

RECOLLECTIONS OF CAMOUFLAGE. By Lieutenant Burton Harrison, Spec.-Res. *The Field Artillery Journal,* Vol. XVI, No. 4. July-August, 1926. Pages 350-357 inclusive. Published by the U. S. Field Artillery Association, 1624 H Street, N. W., Washington, D. C.

Lieutenant Harrison relates an amusing anecdote brought about by the urgent necessity of protection from the Paris-raiding Gothas. The camouflage of one fifty-foot stretch of trench was quickly attained by the use of salvaged chicken wire camouflage netting which was so perfect that it fooled a mule from Missouri so completely that the mule was precipitated into the trench. The anecdote was related to show that if a Missouri mule could be fooled from close up observation, then certainly the raiders from Berlin could be foxed easier.

Another highlight relates the occupancy of a small area left by the retiring Boche and the erection of two folding trees which were blown to bits within the hour of their erection, much to the disgust of the engineer officer who erected them.

The incidents are related to show the troops were readily acceptable to the idea of camouflage but were impatient to accept the necessary stagecraft "where other and more simple means were getting results."

Some rules developed by Lieutenant Harrison's Battery "A" between February and November 1918 were:

They "took up but three positions in which fish nets had to be used, relied on woods, shrubs, bushes, etc., for fourteen positions, occupied but three 'permanent' positions, and used no camouflage in two positions."

"We were forced to improvise and work out rule-of-thumb methods when the war of movement began."

"The rules for each position were:

find cover,

do it quick,

and camouflage in the obvious way."

"Usually we would take a position *** bend over a few saplings with fish net guy ropes, take care of potentian flash marks, check up a reserve position, and keep a critical eye on the advance picket line and drivers who were the worst offenders in any phase of camouflage."

In one situation described in the use of fish nets, "We had placed the gun alongside a narrow tall hedge, firing across a road and were supposed to fire shortly." The net became a mix up of guy ropes and poles and "found that the poles would not get the net above the top of the gun shield." "We compromised on this occasion by building the hedge out far enough to encompass the gun and shortly after slashed the fish net into more convenient sections to be used in conjunction with such aid as nature furnished."

In speaking of a field camouflage expert who should be attached to each battery, "Certainly camouflage is sufficiently important to deserve the inclusion of a specialist thoroughly instructed as a part of the special detail. This noncommissioned officer would serve to insure continual attention being paid to camouflage and camouflage discipline."

The following is quoted from Lieutenant Harrison's notes written following the armistice:

"The principal materials used in the formation of artillery cover are burlap, raffia, and canvas, attached to either chicken-wire rolls or cord nets. Raffia and burlap can be used interchangeably. The former is better adapted to the open field, while the latter finds its best location in woods. The nets are usually erected for temporary use and carried on the gun trail. The permanent work is done with chicken-wire rolls, placed over framework, erected to follow the contours of the terrain, and pieced together to form a continuous design."

The "minutiae of the detail" of correctly erecting camouflage is excellently described; and in connection with the study of airplane photographs to better enable 100% camouflage to be erected, the following observations are quoted. It will render the understanding clearer if the photographic tone values are remembered:

Roads, paths and flash marks appear light gray, the more worn the nearer white.

Roads and wagon tracks made in soft earth appear as a series of black lines outlined in white.

Water in shell holes and the tops of extremely high objects are white.

Water in large bodies, ponds, lakes, are deep black, there being no reflection.

Tall grasses, wheat fields, etc., are nearer black.

Woods appear dappled, white gray, and black, and are further determined by an outline shadow.

Trenches, holes and ditches are black.

Houses, barracks, and piles of material appear outlined by their shadow.

Hills, contours, etc., are plainly shown by graduated lights and shadows.

The method by which camouflage is made to reproduce exactly the tone of the ground it covers, is known as "thinning out." Solid burlap or canvas would reflect white. *** "It follows that the more the camouflage is thinned out, the darker the shade reproduced on the plate. For nearly bare ground, camouflage is thinned but little, for tall, grassy locations, it is thinned considerably." "Experience teaches the necessary amount of thinning out, but always the work is checked by 'Before and After' photographs taken by allied aviators at varying altitudes." *** "The East and West edges of the flat top are always thinned out to almost bareness to obliterate the shadows cast by the sun in these directions. If this were neglected, the position would be outlined by a tell-tale shadow."

"In open warfare, nature furnishes the best camouflage in the form of woods and bushes."

WHAT IS CAMOUFLAGE? By Colonel Jennings C. Wise, F. A. Reserve. *The Field Artillery Journal*, Vol. XVI, No. 1. January-February, 1926, pages 46-53 inclusive. Published by the U. S. Field Artillery Association, 1624 H Street, N. W., Washington, D. C. Well illustrated with 16 excellent World War I photographs of camouflage installations.

"A battery seen is a battery lost!"

"What is camouflage?"

"Not what many seem to think. Camouflage is a stratagem which has for its purpose deception, but deception may be accomplished by ruses that in no sense constitute camouflage."

"The distinction between ruses that constitute and that do not constitute camouflage is of far more than academic." ***

The French word CAMOUFLAGE "was coined to designate the strategical art of obscuring, or throwing the one whom it is designed to deceive, mentally into the dark. In other words, to camouflage implies that the observer shall not perceive what is within the sphere of his vision, either because it is rendered invisible, or because it is made to appear to be a part of something else, therefore, not distinguishable in its true physical character. At once, we see that many things which are called camouflage are not camouflage at all, but, properly speaking, are ruses of some other kind."

"Ruse, on the other hand comes from the French word ruse, meaning a trick, artificial, or stratagem; may imply more than the stratagem by which the mind of the person deceived is thrown in the dark simply through the failure of the eye to discern the thing obscured by trick or artifice." ***

"Inasmuch, therefore, as camouflage involves the element of invisibility it may be said that to the extent the visibility of a thing is diminished, camouflage is employed."

Nature and savages early employed camouflage and are constantly improving it.

"In a landscape there is a great confusion of the detail of natural objects. All natural objects are irregular in shape and complex in outline. Any symmetrical object tends to catch the eye at once. In nature there are no straight lines (except the surface of water), no circles, no squares, and although there are bold variations, there are no sharp contrasts in color and tone of natural objects. Consequently, form, no less than color, may contribute to the visibility of a thing, so that a symmetrical object, or objects symmetrically arranged, such as gun carriages symmetrically arranged in regular order, tend to catch the eye at once." ***

"Some highly effective ruses result from the instinct of cunning alone. Camouflage, however, is an art that requires to be studied, if it is to be effectively applied, and, generally speaking, will not develop out of the mere instinct of cunning alone." ***

Several excellent historical examples are given to illustrate the points brought out by the author.

"The use of submarines, smoke screens, breastworks, trenches, feint attacks, the suppression of camp fires, lights, and the enforcement of silence, night marching, and the avoidance of visible movements are, however, though stratagems, neither camouflage nor any other kind of ruse, but simply means of concealment of the presence of an adversary, resulting not from any trick designed to deceive but merely from the intelligent use of concealment." ***

"Sometimes the effect of a stratagem may be that of the combination of camouflage and some other form of a ruse. Thus in France, the camouflage engineer frequently substituted, during the night, a hollow metal replica for a tree trunk, in which an observer could be posted." *** Several other examples are given.

"Thus, it is seen, that, since the object to be obtained by the use of stratagem may be one thing or another, in order to employ camouflage intelligently as a stratagem, the fundamental distinction between their effects, and the objects to which it and other ruses are adapted, alone and in combination, must be thoroughly understood, lest the general be deprived of the advantage which stratagem may be made to yield to him."

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STAGGERED POSITIONS. By Captain John M. Devine, F.A., Department of Gunnery, The Field Artillery School. *The Field Artillery Journal,* Vol. XXII, March-April, 1932. No. 2. Published by the U. S. Field Artillery Association, 1624 H Street, N. W., Washington, D. C.

This author comes to the same conclusion as every other writer on this subject, and that is "In this day of air observation and air photography the necessity for concealment of a battery in position is obvious." He states that "a battery once spotted by a hostile plane, or picked up on an air photograph, may be neutralized practically at the will of the enemy. It is, therefore, axiomatic that every possible precaution should be taken for concealment."

Further "The most important single step in concealment is staggering the guns. Regularity hardly ever occurs in nature; equally spaced spots on an air photo usually indicate the works of man, and four spots lined up at regular intervals nearly always mean a battery. Staggering alone provides a degree of concealment comparable with camouflage and it makes the business of caumouflaging much simpler."

"Furthermore staggering permits the use of natural cover." ***

"In the event of another war, staggering will be the rule rather than the exception."

"And yet the actual business of staggering is sidestepped. Admittedly, in theory, it is the thing to do. But in practice it is avoided. It is avoided because of the difficulty in handling the sheaf when guns are not spaced at regular intervals. It is avoided because no simple means has so far been developed to overcome this difficulty."

"The purpose of this *'excellent'* article is to put before the Field Artillery a proposed solution of the problem, and to provide comment and discussion with the hope of arriving at the best solution." It is therefore highly recommended to all Marines who would know more of this method of concealment and control of the sheaf of a battery occupying staggered positions.

CAMOUFLAGE FOR ARTILLERY. By Lieutenant A. E. Wilson, C.A.C. Published in *The Field Artillery Journal,* Vol. 70, No. 1. January 1929, pages 63-66 inclusive.

An application of camouflage to fixed defenses, railway mounts and all other mobile artillery.

Lieutenant Wilson states, "In a military sense camouflage is work done for the purpose of deceiving the enemy as to the existence, nature, or location of material, troops, or military works. It is simply counter-intelligence work designed primarily to defeat or neutralize the means of intelligence provided the enemy by airplanes, captive balloons, and terrestrial observation. Deception of the enemy is the prime object. Provided the object seems a natural part of the surroundings, concealment is not essential."

"There are three ways of gaining this deception: by suppression of all signs of abnormal activity near the object or deceiving the enemy as to the purpose of such activity, by making the object indistinguishable from its surroundings, and by making the object appear to be something else." ***

"In the case of fixed defenses the camoufleur is confronted with a most difficult situation: the large concrete amphitheatre, the smooth, well kept slopes and numerous walks, all combine to make a position extremely hard to conceal. This can be and is being obviated to a certain extent by allowing the slopes to become overgrown by bushes and long grass, so hiding them from direct observation from the sea. The airplane still remains, and in this case we must depend almost wholly upon paint, as the position is too large to hope to screen. Here the five color system comes to the aid of the camoufleur. This system is the scientific blending of brown, yellow, cream, green, and mauve, with a narrow border line of black, the latter being used only to stop the line of vision. The mass of the position is apparently broken up into several fragments or masses by the use of ultravisible colors in conjunction with colors that record no plane and this system also disguises the true character of the visible portions. By the correct selection and application of pigments the plane of the surface upon which they are applied may be made to appear in several planes. Also the scientific selection of colors will defeat visibility and by chemical preparation of the pigments ray-filters are defeated. The object of this system is to resemble foliage, to compel the eye to record the portions painted green and brown and to fail to record the portions painted cream and mauve. Yellow is used only to counteract shadows. No attempt is made to blend the colors. Thus the airplane is defeated for the reason that it acquires false information only. Even at very low altitudes the real facts are hidden by the five-color system."

"The stereoscopic camera that detects falsely delineated perspective or pigment painted shadow is defeated by the use of opaque pigments for near planes and transparent pigments for far planes, by the use of mauve in juxtaposition with its complement by yellow used to counteract shadow, by a scientific application of the laws of light and color, and by the camouflage of shadow." ***

"To break up the shadow silhouette of the long gun, metal fins cut in the form of foliage and painted to blend with the color patches on the gun are bound to the gun. These will break the skyline of long guns and carry the eye away from the gun form. Thus, while concealment of permanent positions presents a difficult problem, it is by no means insurmountable."

On the camouflage of railway mounts the author states the problem and answer as follows:

"The camoufleur has not only the great size of the piece and mount to consider, but the many types of terrain. He must hide not only the gun itself but also the dumps and tracks leading to the position. In hiding the gun and its mount the five-color system again comes to his aid. In fact so successful is this system that in photographs of railway mounts, taken at only 1,200 feet directly over the position, it was not possible to find the guns although they stood on bare ground in an open tract with no covering other than paint applied to them. Hiding the dumps and tracks is a difficult problem and must depend on the character of the terrain. It is obvious that a position in a wooded or rough terrain is much more

easily concealed than one in the flat open country. In the first case it is possible to erect a screen over the work or, better still, any trees cut may be saved and reerected by artificial means in their original position. The foliage may be replaced by dyed cloth or by fresh brush tied to the trees. Paths may be hidden by brush scattered on the ground, though it will be much more effective if elevated on wires to about the height of a man. In any case it must be remembered that the means of concealment must approximate the photographic color displaced and that continuous upkeep is necessary."

"With semi-permanent positions, such as the 210mm the same care must be taken as in the case with the railway. Since the enemy is going to know very shortly the approximate location of any heavy battery and will cover that locality very carefully to find that position, we must give him something to find. Here the dummy position is most valuable. It must not be obvious or he will pass it up; it must be constructed with just slightly less care, or, you might say, more care than the actual position as the enemy is to see what you wish him to see and no more. A good camouflage maxim is, 'Make your dummies at the same time or before your real positions.'"

"In the camouflaging of positions for lighter mobile artillery many methods are more or less familiar to all artillery men. *** The screen or net. *** Also the three-color system, while failing utterly when applied to the railway mount, is satisfactory for use with smaller types. This is the use of green, yellow and cream in small irregular patches separated by heavy black masses also in irregular shapes. *** The endeavor here is to hide the piece by blending its form and shadow with the landscape. *** There are a few essentials to remember. *** So conduct the installation of the battery as not to change the aspect of the locality *** avoid straight lines and angles *** place the battery in a position where more than one color exists *** materials lying flat photograph light while materials on end photograph dark *** all work must be planned on a scale in proportion to the distance, keep only enough personnel and material at the position to fire the guns, maintain camouflage by strict discipline."

In summing up his article, Lieutenant Wilson states: "In summary, the following points should be stressed:

First: Select your position with great care, one with natural material being available being preferable wherever possible.

Second: Make a sketch of what you think the position would be like in an aerophoto and so conduct the work that the general aspect is changed as little as possible.

Third: Use existing roads and paths wherever possible.

Fourth: Locate kitchens, latrines, etc., away from the guns.

Fifth: Use natural material to the greatest possible extent, remembering that brush is the best and most important camouflage material.

Sixth: When your camouflage work is completed the real work is just beginning for the most important and most difficult task is the maintenance of camouflage discipline."

CAMOUFLAGE OF SEACOAST FORTIFICATIONS. By Homer Saint-Gaudens, Lt. Colonel, Corps of Engineers Reserve. Published by *The Military Engineer*. Vol. XXIII, No. 131. September-October 1931. The Mills Building, Washington, D. C.

"During the World War, it became evident that the only means of ultimate preservation in action of all description was camouflage from both direct and indirect observation. The general principles of camouflage are to a certain degree applicable to the camouflage of seacoast batteries. In both cases camouflage consists in hiding from the enemy the center of our offense, so that we can find and destroy him before he finds and destroys us. In both cases camouflage is a coordinating auxiliary means of defense which should relate itself in proper proportions to earth works, combat planes, antiaircraft guns, paraboloid detectors, searchlights, and sausage balloons, either to provide protection from hostile fire and to confuse and bring down the observer, or to cause him to fly so high as to destroy his accuracy."

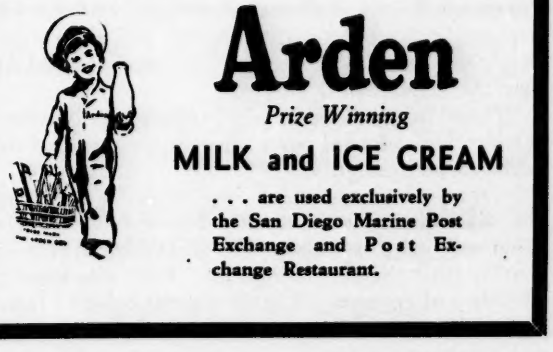
"Here the similarity ceases. There exists a vast distinction between what may be done with the large engineering undertaking involved in permanent fortifications and what is necessary properly to hide field artillery. For example, the first law of successful camouflage of both field and permanent positions consists in presenting the terrain in a condition apparently undisturbed by military activity. The original condition of the terrain in open warfare is obvious. The 'original condition' of a permanent fortification depends on whether the location is accurately known to the enemy, approximately known, or unknown."

Thus if a seacoast battery is known to be within the confines of a small area, camouflage would be quite useless.

Here also, knowing the characteristics of the terrain in the area as well as the characteristics of the battery, it is obvious that the enemy will know that the battery is within a small area. Here camouflage helps. In the case of the enemy not knowing the area in which the battery is located, camouflage becomes very important.

"The chief considerations in the adequate camouflaging of coastal fortifications are:

the nature of the terrain,
the silhouette of the battery,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the form of the battery,
the regularity of its layout,
the strength of its shadows,
the disposition of its roads,
the need for artificial cover,
the need for painting,
the need for planted foliage."

In the case of the terrain the author points out that our east coast presents the most difficult situation as to the camouflage of seacoast defenses. On our west coast the problem is simpler. And in our tropical possessions the problem is quite simple.

In the silhouette of the battery, "It is most important, therefore, that a naturally monotonous skyline should be sought and that plans should be made to destroy at once in time of war such objects as neighboring high factory chimneys, water towers, life saving stations and outstanding buildings for a considerable distance on each side of the battery." ***

As to the form of the battery the "Mechanical shapes and shadows in all military and engineering construction have a habit of repeating themselves with disastrous regularity." *** "Regularity is the most serious of all." *** "All concrete construction, therefore, should be made irregular on its edges, so that it will blend with the terrain. The guns themselves must be located with lack of system."

"Roads, paths, *** railroad tracks, electric lines and drains must be reduced to a minimum." *** "Whenever it is necessary to construct a road to a position, it becomes essential that the road be carried beyond that position to a distant point, and that the road appear to be used evenly throughout its length."

"In the matter of roads and paths *** only the most essential roads and paths may be used by battery personnel and then must be carefully camouflaged, wired to prevent widening, subjected to the restrictions of severe camouflage discipline, and led past the object they are intended to serve." *** "When it is not feasible to hide (railroad) such tracks, *** much may be accomplished by extending an extensive system of dummy tracks and switches." ***

"The presence of shadows, more than any other cause, requires overhead cover, popularly thought the sole essential of camouflage."

"Complete overhead cover for heavy guns presents a difficult problem. *** The only method of avoiding this impossible requirement is to use a 'stepdown' process. Here the flat roofs of camouflage as they extend from the center drop in successive steps, each roof projecting irregularly above the roof below, the first being over the gun, the second over the loading platform, the third ovtr the emplacement."

"Therefore, to prove genuinely effective, all permanent fortification overhead cover must be the result of painstaking experimentation." ***

"Actual painting is of less importance, as it disregards the vital quality of texture. However *** covering them with irregular masses of contrasting colors helps to destroy their characteristic forms. Paint also lessens the visibility of concrete since the natural color of concrete is so light as not only to be easily seen from the air but to increase the density of the shadows thrown on it by adjacent objects. The color of the paint should always be darker than natural adjacent objects because the dark shadows which fill all vegetation cause the vegetation to appear from the air as much darker than from the oblique view from the ground observer. *** The best results, once the chemical constituents are determined, have been obtained from asphaltum paint of dark green or neutral colors, applied in huge patterns. These designs are of least value under strong sunlight. But even though absolute camouflage may be impossible, painting improves the situation when the visibility is low, or at night, when the fixed target is at an especial disadvantage as compared to the moving target that may approach (to it) with safety to much closer ranges."

"Another paramount branch of camouflage in the case of permanent fortifications is the proper persistent, confused planting of all possible forms of natural foliage." *** "At night *** an occasional dim 'fake light' might be of advantage if set up at considerable distance from the battery." ***

"The actual guns are the first objects to be camouflaged." ***

"Next to the batteries themselves observation towers are matters of camouflage concern." ***

"The concealment of antiaircraft guns against air bombing is of scant value, since, when cleared for action, they cannot be hidden at the one moment when they are in danger of observation. However, the enemy force will naturally attack the main positions. Therefore, antiaircraft guns may still function properly if placed so far from the main batteries as not to assist in their identification." ***

"In estimating a situation in regard to camouflage then there are five chief points to consider. First, camouflage should be correlated with other defense. *** Second, camouflage is employed only to a slight degree against naval gunfire, but to a greater degree against airplane spotting and bombing. Third, the nature of the camouflage depends upon the nature of the terrain. Fourth, a battery betrays its position chiefly through its silhouette in the case of lateral observation, and through its regularity, its system of roads, its actual form, and the shadows cast in the case of air observation. Fifth, the main objects to be protected are the batteries, the observation towers, the buildings and the accessories. Failure to hide one outstanding evidence of occupation may invalidate all the other camouflaged efforts." ***

"If camouflage efforts are not considered worth while carrying through completely, it is wise to abandon it altogether and devote the available time, force, and money to other methods of protection."

This article should be required reading and study for all members of Marine Corps Defense Battalions.

EXPERIMENTS IN CAMOUFLAGE. By Charles Crane, Captain, Corps of Engineers Reserve. Published by *The Military Engineer*, Vol. XXV, No. 139. January-February 1933, pages 78-79 inclusive. Three excellent illustrations.

The author relates the results of experiments conducted in the Second Corps Area in 1932 to develop data

on the detection of artificial camouflage by the use of color filters in aerial photography.

"The primary purpose of the experiment was to ascertain to what degree it is possible to fool the camera with camouflage material of several colors in a pattern too small to be resolved in the photograph."

"With the color filter, however, we have an improvement on the human eye, for by their use we can change the intensity of the shades between black and white which represent colors in a photograph."

"For example: a red filter will make green appear nearly white and a yellow filter will eliminate the shade caused by blue color." ***

The author points out that the contrasts in color if accentuated by a difference in spectrophotometric reflection value between natural and artificial material will greatly assist in the detection of a camouflage installation.

In describing the experiment "a net was prepared by sewing to it unbleached muslin painted with four colors, gray, yellow, burnt umber (reddish brown) and green in a checkerboard pattern of 4 inch squares. A checkerboard pattern was used to facilitate the control of percentages of color and the relationship of one color to another. A control net was also made, using the same colors but in much larger areas."

"The theory was well demonstrated, for all the photographs taken from the air, using a variety of filters, portrayed the checkerboard as a solid gray or neutral tone of varying intensity, while certain filters brought out the colors on the control net. Considerable experimentation would be necessary with various colors in order to select those in the proper combination of spectrophotometric characteristics for good results on the terrain on which the material would be used. It is believed that this is possible, however, and furthermore, that a combination could be secured which, while perhaps not an accurate match in any one position, would nevertheless be sufficiently broken up in general tone to serve for average use in various localities."

In the tests it was especially pointed out, "that the selection of a suitable position is far more important than the actual camouflage material used."

Also, "Even if it were possible effectively to camouflage the positions, proper camouflage discipline must be strictly maintained in connection with all activities of personnel."

In ending the article the author certainly speaks true when he states: "Concealment and camouflage discipline must become second nature, certainly, to every man in uniform, and perhaps to a large proportion of the civil population."

FIELD CAMOUFLAGE AND AERIAL PHOTOGRAPHY. By H. A. Finch, Lieutenant Colonel, Corps of Engineers. Published in *The Military Engineer,* Vol. XXIV, No. 133. January-February 1933, pages 30-35 inclusive. Well illustrated with aerial photographs showing the detection of camouflage.

An excellent article on aerial photographs and camouflage. Relates the results of experiments conducted at the Engineer School 1930-1931 to test the ability of aerial photographers to detect installations on which carefully placed artificial camouflage was employed. At first only a K-1 (Aero-1) light yellow filter (to counteract haze) was used. Later various color filters were used in the vertical photographs.

The camouflage doctrine as taught at the Engineer School under the direction of Lieutenant Colonel Homer St. Gaudens, Engineer Reserve, stresses the following principles: Proper selection of position (for dump, battery, machine gun nest, etc.) should utilize natural cover and rates 40% in importance, camouflage discipline—25%, proper erection of camouflage—20%, and type of camouflage materials used—15%.

After the gun positions had been selected for the tests, "A sequence of photographs (*unfiltered* except for the use of the K-1 filter (for haze) was taken, each complete sequence consisting of photographs at altitudes of 3,000, 5,000, and 10,000 feet," only those taken from 3,000 feet being used as illustrations. The photographs taken before, during, and after the camouflage was erected, depict the difference of good, bad, and indifferent camouflage, and the errors of the camoufleurs, and the article discusses the detection of the different types used.

In one photograph No. 7 and later ones, the different tone values of tan, olive drab, dark green, reddish brown and dark brown are pointed out.

The conclusion reached on this phase of the work with unfiltered photographs is that the work done "is difficult to detect even in views taken at very low altitudes."

COLOR FILTER PHOTOGRAPHS

"The Fort Humphreys 1931 experiments were designed to develop whether or not the technique of aerial photography through color filters had progressed to such an extent as to require the camoufleur to revise his estimate of the value of military camouflage."

"The filters identified with the various photographs are classified in order of density from least to greatest.

Number	*Color of Filter*	*Approximate Characteristics*
K-3	Yellow	Cuts some of the blue. Transmits remainder of spectrum.
15	Yellow (deeper)	Cuts blue and blue green. Transmits remainder.
29	Red	Cuts all except red. Monochromatic.
58	Green	Transmits green and yellow. Cuts remainder.
31	Violet	Cuts green and yellow. Transmits remainder.
44	Blue	Cuts red. Transmits remainder."

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"It has been claimed that a sequence of views of the same terrain taken from the same altitude and under similar conditions of light but with a different color filtered out of each separate photograph, will make artificial camouflage stand out against its natural surrounding. For the benefit of the non-camoufleur it may be said that the detection, if any, will be brought about by the contrast, in tones of gray on the photographic prints, between the camouflage pattern and the background, under some one or more filters, the theory being that paints employed in tinting the camouflage will not have the same light transmission values, under all filters, as the surrounding natural objects." ***

"For the colors on the various panels and the combination producing them are listed as follows:

Panel	*Color*	*Combinations*
1	Reddish chocolate	Equal parts, by volume, of blue, yellow, and red.
2	Violet	Same as No. 1, with 50 per cent of white.
3	Sage green	2 parts blue, 2 yellow, 1 red.
4	Grey green	2 parts blue, 2 yellow, 1¼ red.
5	Bluish grey	3 parts blue, 3 yellow, 2 red.
6	Reddish grey	3 parts blue, 3 yellow, 2¼ red.

For the mixtures, oil paints (commercial products) were employed, the three primary colors used being medium shades in each case; the red, for example, being a clear vermillion, between a light scarlet and a deep crimson." ***

Comments on the Filtered Photograph

"Filtered photographs in these experiments produced disappointing results for those observers who anticipated that the camouflaged installations would be definitely disclosed by this means." ***

"Even the solid colors in the panels are clearly outlined in only three of the six photographs, although the panel frames are more or less visible in all of them."

"One other photograph taken through a blue-green filter (No. 45A) and one through an orange monochromatic filter (No. 90) showed results too poor to be worth reproducing."

"Filter No. 90, particularly, proved to be unsatisfactory for aerial work."

"All of the photographs discussed herein were taken in late winter and spring months before a great amount of green had appeared in the natural landscape." ***

"One of the early discoveries in connection with color-filter photography was that a camouflage pattern tinted with chrome-green paint to harmonize well with the natural grass background would, when viewed through an infra-red filter, appear *to the eye* as an intensified green pattern against a flaming red background. This effect is due to the fact that the green of nature contains red tones which are passed by the filter, while chrome-green has no red transmission at all."

"Although of interest to the camoufleur, the possibility of detecting chrome-green tinted camouflage by means of infra-red filters possesses only academic value up to the present because such filters are not adapted to aerial photography, being so 'heavy' (dark) that the short-time exposures required in aerial work are consistently underexposed." *** (It must be remembered that this article was written in 1932.)

"In any case, the camoufleur's defense against the infra-red filter involves nothing more complicated than avoiding the use of chrome-green, Prussian blue, black, and a few other paints that have no red transmission value."

The author then concludes the article by discussing the future worries of the camoufleur when natural color photography is developed to such an extent as to be practicable in the field.

Camouflage Reminiscences. By Homer Saint-Gaudens, Lieutenant Colonel, Corps of Engineers Reserve. Published by *The Military Engineer*, Vol. XXV, No. 141. May-June 1933. The Mills Building, Washington, D. C.

Early in World War I Colonel Saint-Gaudens arrived at the following conclusion:

"My philosophy during those months of 1918 was that camouflage must focus its efforts upon simple rules for exhausted men, mostly in artillery."

"As similar conditions will unquestionably maintain in our next struggle, camouflage in the future must continue to direct green soldiers to hide simply and practically in sufficient measure to allow them time to find and destroy their enemy before the enemy is able to find and destroy them. Given a target our troops must reach and an area they must enter, the problem resolves itself into where they can hide most simply while their power of offense remains most effective."

"Camouflage, both as we practiced it in France and as we plan it for the future, has suffered from too much loose conversation, newspaper propaganda, and the inability on the part of the average soldier to use his eyes."

By certain examples of A.E.F. camouflage that the author was called upon to inspect in France he points out the mistakes made by the troops using the camouflage.

In comparison to this he notes the excellent manner in which the German troops used natural materials for excellent camouflage.

He then arrives at the following correct conclusion. "The fundamental principle of camouflage then is to take whatever advantage possible of the basic character of the terrain."

Then by the use of A.E.F. examples Colonel Saint-Gaudens points out and describes several excellent examples of the correct installation of artillery camouflaged under all conditions.

Deploring the amount of useless effort expended trying to soothe the nerves of the higher-ups in the application of camouflage the author points out how much of this might have been avoided if those higher-ups had understood what it was all about.

In conclusion he states:

"Camouflage then is no vaudeville magic. It requires trouble, horse sense, and an ability to take advantage of local conditions. It is Indian fighting. Camouflage is

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not so much to hide an object from an enemy as to fool the enemy as to the object's whereabouts."

An excellent article, well covered by the Colonel.

CAMOUFLAGE SERVICE IN THE A.E.F. By Homer Saint-Gaudens, Major, Engineer Officers' Reserve Corps. Published by *The Military Engineer*. Vol. XVII, No. 93. May-June 1925. The Mills Building, Washington, D. C.

Major Saint-Gaudens relates of the skepticism of the A.E.F. towards camouflage of the composition and trials and tribulations of the Camouflage Section of the A.E.F.

It was practically impossible "to balance the foolish mistakes made through indifference to camouflage needs behind the front lines." The different corps and army artillery blamed each other for the fracture of camouflage rules.

When the Second Division met the German drive early in June, this lack of camouflage discipline first became evident to the author.

"At the outset the whole army seemed to be from one state—Missouri, and it demanded to be shown. 'We've never been shelled out yet,' was the old answer, whenever we hoped to avert the impending doom." After relating several anecdotes in reference to the mysticism of camouflage as thought of by the A.E.F., he continues:

"The very first thing that we learned was that camouflage is bound to be treated in the most hasty, rough-and-tumble style by tired, overworked men." ***

"Also, generally you have no tools and not much material and no means of getting any."

As a rule we had:

a lieutenant in charge of the work in each division,
a captain in charge of the work in each corps,
a major or captain in charge of the work in each army,
a lieutenant or captain in charge of the work in corps artillery,
and a lieutenant or captain in charge of the work of the army artillery.

About eleven or twelve men were needed for each of these units, more if green men had to be trained, as a new man was of little use until his second month at the front."

"The result was that we required of our officers more responsibility and initiative than was expected in the same grades in other branches of the service." ***

"To be Irish, our best officers were our sergeants and corporals." ***

"Camouflage work consists not merely in concealing from the view of the enemy objects to be camouflaged, but also in concealing from him that any camouflage work whatever has been done. He must be kept in complete ignorance of any changes of conditions. Also, in this world of toil, camouflage benefits are directly proportionate to the labor involved." ***

"Concealment from the eye may be accomplished by imitating something else, by making an observation post look like a coil of wire, or by disguising an object so that it is not seen at all, or looks like nothing in particular. A sniper's helmet may so match the parados of a trench as to be invisible. Objects to be concealed from the eye were such as, observation posts, sniper's posts, machine gun emplacements, and roads. Most front line work came in this category and consisted merely of a clever manipulation of the surroundings, backed by a slight knowledge of what things looked like from a distance. The Germans were especially ingenious in this, perhaps because with them artificial camouflage was hard to get. Our own officers were content to drag any old camouflage cloth over themselves, personally deaf to our remonstrances that it was not so much what was put up as the way it was erected."

Road screening was also hard to "put across" to the troops.

Of concealment from air observation Major Saint-Gaudens states:

"Concealment from air observation was more difficult, as the camera was more accurate than the eye. Objects so concealed were batteries, tracks, woods, trenches, and dumps. In this, we were least successful because we were rarely able to show our army the proof of the pudding. They could see what they could see. But, without photographs they could not see what the camera saw. They would not take our word for it and the Photographic Section of the Aviation Corps never produced the results until too late."

"Our Intelligence Section did not spread the information obtained from reading photographs systematically, as was done by the French from their school in Flavigny and by the British." ***

"German prisoners told us how widespread was this knowledge among them and how bad they thought our methods. They had no camouflage section, but all their officers were educated in photographic reading. The batteries were constantly inspected for camouflage and, when one was shelled, the commanding officer received a court-martial. They paid especial attention to camouflage discipline, to the restriction of paths and tracks. They placed their guns at unequal distances and at unexpected places." ***

"Photographs show patterns of black and white, composed of color, form, shadow, and texture. Color proved to be of relatively small importance." ***

"Camouflage must conceal both the form of the object and the shadow thrown by it. Form is shown by the

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gentle gradations of light and shade thrown upon an object." ***

In conclusion the author states:

"There should have been schools for men of the Camouflage Service. This school should insist upon:

(a) Selection of positions that can be camouflaged. This is more than half the struggle.
(b) Strict camouflage discipline.
(c) Proper erection of material.
(d) Proper material.

Despite failure in detail, we did accomplish and we did develop. We started as painters of a new brand of painters. Before the war had closed we had swung into our stride. Army, corps and divisional headquarters all reached a point where they not only sought but demanded and followed our advice."

LIGHTWEIGHT ASSAULT TROOPS

(*Continued from page 20*)

Gasoline bottle (Molotov cocktails).
Thermite grenades.
Smoke and chemical grenades.
4½ lb. TNT demolition charges, with fuzes and placing poles.
Bangalore torpedoes.
¾" iron grapnel hooks and towing cable or line.
Heavy wire cutters.

The twelve privates listed above and armed with pistols only are the carriers of the pioneer equipment. The amounts to be carried must be determined by the difficulty of landing the equipment and the size and type of the task to be accomplished. The Corps of Engineers, U. S. Army, have been, and are, carrying out exhaustive tests in the use of the above equipment with a view to developing the tactics and technique of assault engineer troops. Training in the use of this equipment is not difficult.

The gasoline bottles (Molotov Cocktails) are quart bottles, full of a mixture of 50% oil or creosote and ordinary gasoline, with a pad of cotton on the bottom of the bottle. They may be lit by a match or a fuze lighter and thrown against the objective to blind ports and set fire to the material they come in contact with. The thermite grenades are for the same use and for general incendiary use. The chemical grenades are mainly smoke producing agents to cover the close advance of assault parties to their objectives. The Bangalore Torpedoes and the TNT charges are the demolition equipment for partial or complete destruction of solid objectives. The grapnel hooks and towing lines are for clearing breaches in barriers and obstacles. The wire cutters should be of the heavy type since the regular wire cutting pliers are standard equipment for all members of the squad.

(3) *Training and tactical employment.* One of the main points to be stressed in the training of these assault troops is speed of movement. Men should be selected for these units who are young, agile and excellent athletes. Their training should embrace a great amount of disembarking on all types of beaches and in all types of surf. They should be trained in getting clear of the beach quickly and selecting immediate cover. Speedy movement over difficult terrain and the traversing of barriers and obstacles should be stressed. Their tactical training should emphasize a daring, swift attack to the flanks and rear of defense installations; never a direct frontal attack. Special drill should be given in the methods of attacking such installations as: entrenchments, pillboxes, emplacements and machine gun nests. The combat engineer squads should actually rehearse the assault and destruction of the above installations as well as barriers and beach obstacles. Successful employment of these troops will demand energetic, resolute and at times even unorthodox junior leaders, capable of attaining and maintaining an extremely high state of morale in their commands.

In the larger tactical picture, the assault waves of a landing operation could well be made up of these lightweight assault troops and light tanks, mutually supporting. They may be landed in the same waves with the tanks or in the second wave immediately following the tanks; in squad boats or the new Roebling Alligator Amphibian. If in the assault of a defended beach they carry the first line of beach defenses, either destroy or partially destroy enemy installations and barriers, and then completely "fold up," their job has been well done. The very fact that these troops are so lightly equipped and armed makes it imperative that their assault be closely followed up by heavier infantry and its accompanying elements. Once the heavier troops have landed and pushed through the ground lightly held by the assault troops, the latter may be withdrawn for reorganization, issue of packs, rations and replacement of equipment; and held as a reserve. Due to their special training and equipment these troops are admirably suited to such special tasks as reconnaissance in force, combat patrols, raids into enemy territory, and the support of tank attacks.

The organization, arms, equipment, technique and tactical employment of these troops is something that only actual experimentation with troops and materiel will fully develop and prove or disprove their suitability to the task at hand. Therefore, the suggestions as to organization and equipment, made above, are solely for the purpose of demonstrating the need of this type of landing troops. This article is not meant to recommend "whole-hog" adoption of Nazi "Blitzkrieg" tactics and technique, but merely to suggest that it is time that we discard some of our shop-worn concepts of amphibious warfare. We should progress a little more rapidly towards advanced experimenting in keeping with modern warfare and its weapons, to prepare ourselves thoroughly for the special and difficult task which is certainly ours. We might change the time-worn phrase of General Bedford Forrest from, "He who gits thar fustest with the mostest men," to, "He who gits thar fustest with the mostest shootin'."

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